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THE NATURE AND MEANING OF TEACHING

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BY

RALPH F. STREBEL

Assistant Professor of Education, Teachers College, Syracuse University

and

GROVER C. MOREHART

Associate Professor of Education, Teachers College, Syracuse University

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TO

Dean Albert S. Hurst

OF

TEACHERS COLLEGE, SYRACUSE UNIVERSITY

PREFACE

During the last decade, many contributions have been made to the literature of general methods. Probably in some respects, the subject has been overwritten. Most of these treatises have developed a different perspective of the problems of classroom teaching. A great mass of material is now available which is invaluable as a source of collateral reading for students of education. The book, however, has not yet appeared, and perhaps never will be written, which exhausts the field of general methods for its ramifications are too great.

Teaching techniques are, of course, firmly rooted in the philosophy of education and the psychology of learning. What the teacher is to accomplish with the child, and the nature and mechanisms of the latter's reactions, determine the method to be used. As our philosophical concepts grow and our knowledge of the learning process increases, our methods of procedure must be amended to keep pace with the development.

It has not been the purpose of the authors merely to add another book to the already great stock of literature now at hand, nor do they wish to be understood as having made an original contribution to educational content. The sole objective in writing this volume was to attack the problem of the technique of teaching from a different point of view from any extant.

The material for the book has evolved slowly and naturally over a long period of teaching general methods, educational psychology, and philosophy of education. The course in general methods as outlined here has been given to large groups of both experienced teachers and preservice students of education, and is the result of a careful refining process. Only those methods which have stood the test of successful classroom application are given in final form in this work.

In writing this book, the authors have kept in mind that its greatest use would be in teacher-training institutions where beginning teachers are prepared for the field and by teachers in service who wish to advance professionally. It is the authors' experience that in the case of either of these two classes of readers, a non-technical, lucid treatment is most highly desirable. A deliberate effort has been made to reduce modern practices in teaching to their simplest terms and to interpret these procedures with a type of simplicity which places the material within the grasp of all classes of readers. Such a book of interpretation is needed at the present time.

To effect this purpose the authors have included as many devices to help in the organization of the material as seem practicable. The contents are carefully arranged in topical order, the table of contents is made to serve as a complete outline, an abundance of actual classroom experiences is selected to illustrate the principles, and each chapter is summarized by use of a series of "flow charts."

The authors have used Thorndike's "Laws of Learning" as the basis for their interpretation of teaching procedures. They are not unmindful of the great contributions to the field of educational psychology made by other eminent psychologists, but they feel that since the laws of learning give a sound interpretive basis without involving the reader too deeply, it is best for the purposes of this book to use them.

Cognizant of the great import of philosophy of education and educational psychology to methodology, the authors have included a chapter on the development of the philosophy of education, another dealing with our modern aims and objectives, and a third giving a brief review of the psychology of learning. An attempt has been made to interpret the techniques in terms of the philosophical and psychological bases outlined in these chapters. A book on principles of teaching could easily become a "recipe book" telling the students of education what to do only, with no regard as to why they should practice certain procedures. The authors feel, as do most of their contemporaries, that such treatment of the subject results in deadening uniformity with an attendant inability to adapt procedures to varying conditions.

Hence, they not only tell what is to be done but *why* it is to be done.

The authors' interpretation of the teachings and writings of Professors Edward Lee Thorndike and William Heard Kilpatrick has been a determining influence bearing directly upon the production of this volume. Their contributions to the fields of educational psychology and the philosophy of education have been determining factors for our treatment of the subject. From many others, too numerous to mention, in the field of education we have borrowed liberally. To them also we wish to express our gratitude. To those publishers who have generously given us their permission to quote from their books, we express our appreciation. Credit for these quotations are given as they appear in the book.

R. F. S.
G. C. M.

Syracuse University,
December, 1928.

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PART I

SOCIOLOGICAL AND PSYCHOLOGICAL BASES OF LEARNING

THE NATURE AND MEANING OF TEACHING

Chapter I

STAGES IN THE DEVELOPMENT OF A MODERN PHILOSOPHY OF EDUCATION

I. THE GOLDEN AGE OF GREECE

The so-called "Golden Age of Greece" was but forty-eight years in length, 479–431, B. C., but it has been well said that during those two score and eight years the city of Athens gave birth to more great men than all the rest of the world ever produced in any period of equal length. At this time the Greeks were in possession of the most advanced learning or culture known to the world. They were the one people who seems to have caught up the contributions to progress from both antiquity and contemporary time. From the oriental nations they knew of examinations, and from the Chinese, philosophy. Their knowledge of mathematics and the decimal system came from the Hindu. Scientific records of phenomena, geometry, and papyrus for writing paper came to them from the Egyptians. They were trained for conquest by Greece's neighbor and ancient foe, Persia. They secured the art of glass making, the secrets of dye production, and the alphabet from the Phoenicians. A great literature, largely theistic, the theory of universal and compulsory education, crude notions of the psychology of exercise or practice, and the effects of early impressions were learned from the Hebrews. From their own ancestors came an excellent example of socialism in education, and complete state supervision with its consequent failure.

To some extent the political history of ancient Greece is analogous to that of the United States. The energies of these youthful people had pushed them to the westward along the shores of the Mediterranean Sea. The land that came under their dominion was known as "Magna Grecia" or Great Greece. Syracuse, in Sicily, was one of their "wild west" cities.

As is always true of such pioneering, young men of great vigor led this westward movement which had laid the foundation of the ancient Greek provincial system, and as in our own conquest of the west, there were plenty of hardships. But nothing so develops the ingenuity of a people as does meeting emergencies. Necessity is the mother of invention, and she appears in all her various forms in a pioneer country. On the outer border, man, so long accustomed to artificial devices with which to meet the demands of life, is suddenly thrust backward and compelled to face serious crises with his wits alone.

From such a life some of these hardy souls had drifted back to Greece proper. Those who had education naturally had a very practical, not to say material, kind of learning. Among other things they believed that there are always two sides to a question. This quickly got them into difficulty with the homeland brand of absolutism, that is, with those who had had time and leisure to develop beautiful theories to the effect that right is right and wrong is wrong without compromise.

These progressives seemed to the conservatives like adolescent boys with notions wild and dangerous. In derision, they dubbed them Sophists. The root of the word means wise; but, it was applied to these new radical thinkers to convey much the same idea that our slang term "wise guy" now conveys. But the Sophist philosophy was based on facts, the old on theory. The Sophist on that which the world is like, the old on what men would have preferred, or thought, the world to be like. To illustrate: The philosophers in Columbus' day said the world was flat. They had so decided in their libraries. The facts were quite to the contrary, and while there seemed to be no sense in the idea that it was round, yet it was based on fact, and facts, material facts, are not changed by ridicule. So the

Sophists kindled the fires of a materialistic philosophy which slowly but surely engulfed the more venerable parts of the Greek nation.

1. **Socrates.**—Into this situation the accident of birth projected, 469 B. C., the great philosopher, Socrates. We know little of value of his early life and less of his origin. He did no writing; and, were it not for the fact that his pupils, especially Plato, did write what Socrates had to say, his contributions to thought would be wholly lost or, at best, nothing more than traditional wisdom or folklore. Naturally, students did not come under his influence until he had reached maturity and was capable of attracting them by the merit of his discussions.

Socrates realized that all knowledge must rest on truth or fact. In this respect he realized that the Sophists were right and that their progress must prevail. But he also realized that truth, no matter how materialistic, may also be humane and virtuous and thereby save the finer feelings of the race, the past winnings of the race, and that it is these higher attributes that will enrich the fruits of a factual and materialistic world.

To come more specifically to the work of Socrates as related to this treatise, let us view him as reflected by Plato in the "Republic." Socrates had attracted considerable attention as a philosopher, and, while we cannot account for the conditions which made leisure possible for him, yet we do know that it was his habit to walk about the streets of Athens, followed by a number of young disciples, and to engage possible disputants in learned arguments. It is not likely that there was much profit in this sort of career, and the fact that his wife, Xanthippe, has gone down in history as a famous scold and nagger, is rather poignant evidence that Socrates neglected to assume his responsibilities as provider for his household.

His procedure, when he chanced upon a victim willing to try wits with him, was to ask questions, sharp, decisive questions, which forced his antagonist from pillar to post, to give up one idea after another and finally admit that he did not know the real truth of the matter under discussion. This process is well calculated to arouse resentment and often led to vociferous if not

frequently to violent conflicts, much to the delight of the young men in Socrates' party.

If, however, sufficient harmony prevailed to allow the discussion to proceed, Socrates continued to ask questions, but now of a helpful character so that his antagonist was assisted in building up acceptable ideas and answers to the questions debated.

With his band of followers, Plato, in the "Republic," pictures Socrates going down to the Piraeus one morning. It will be remembered that Athens was built on and around a high hill, the top of which, the Acropolis, was strongly fortified to be used as a last resort in the event of calamitous sieges. The city was heavily walled; and, as it lay about two miles from the sea, it was necessary to make provision for safe journey to the harbor. To effect this, great walls were erected so as to form a narrow lane from the city to the Piraeus, as the little harbor settlement was called.

On the morning in question there was considerable excitement down at the harbor in the village of Piraeus. Some important Athenian had married a foreign woman of no great importance to our story. Her baggage was arriving by boat. The city had declared a holiday and fitting sports and contests were in order to celebrate the occasion. Obviously, it was no great hardship for Socrates and his followers to be there; and in fact for them, as observers of life, no other place could possibly have held an equal interest.

It seems that the objects of especial interest to the Athenian populace that day, were the idols and images of gods which the foreign woman was bringing with her. In those days it was the custom, when one married and went to a foreign home, to take along one's own religious system. Such a system might involve many images and a corps of priests and priestesses.

To the Greeks of that day, images and idols (though to Socrates they could have been little more than so many fine, mediocre, or gruesome statues) held a fascination not easily accounted for. Socrates time and again gives evidences of being a monotheist. Yet with a sort of "be on the safe side" philosophy, he with the Greek populace went down to the harbor and devoutly offered sacrifices and prayers to the newly arrived deities. This shows,

at least, that there was no insane, fanatical jealousy of the supposed powers of their own home idols. This is all the more evidenced by the words of Saint Paul. When he visited Athens and found statues on every hand, perhaps he mistook the art of Greece for her religion; but having seen this multitude of statues he stood on the Mars Hill and exclaimed: "Ye men of Athens, I perceive that in all things ye are too superstitious."

After viewing the spectacle of the advent of the new gods, and perhaps even offering formal sacrifices and devotions, Socrates and his followers turned toward the city. They had gone but a little way when an acquaintance, Polemarchus, sent a servant after the little party and in the interesting and flamboyant fashion of the day, bade them to remain at the house of his father, Cephalus, as there were to be exciting games later in the day and torchlight parades and races at night. In the meantime, the old friends could enjoy themselves with philosophical discussion.

With the invitation accepted no time was wasted in beginning the exchange of learned opinions. While at this point no reference is made to the introduction of strange gods and foreign customs, which was perhaps a prudent considerateness, yet one feels that the motivating power and cause of the rather heated discussions lie in the practice of allowing more and more, untrue, unknown and non-Greek religious and social practices to infiltrate the country.

But, lest the pleasing personality of Socrates engage us too long, let us epitomize his contributions. The transcending question to him was: "What is virtue?" Interpolated, it was, how can one get the most out of life, or what must one learn to do, so that his life will be as rich as it is possible to make it?

Here, then, is the ancient form of our great educational problem. What shall we teach so that those who are taught may enjoy the fruits of life to the maximum of their capacity? Socrates answered this great question as best he could by saying: "Know thyself." Again, interpolating rather freely, he is very close to the modern idea of self-realization.

However, we must not overlook a very significant conservatism in his thinking. He objected, by mental reservation at least, to the advent of the new gods which he and his companions viewed

at the Piraeus. And under cover of anology, he denounced the practice by constantly impeaching the resort to "new fangled" ideas and implements, such as the musical instrument, the flute. His attitude is evidence of the great age of present-day opposition to enrichment of curricula, which, indeed, is a characteristic of our racial conservatism.

Socrates, then, contributes not alone a rather concise statement of our age-long education problem, but he, also, is one of the first to voice objections to extensive experimentation for the purpose of securing the answer to the problem. If he could have said: "We need new and better ways of behaving," he might have sensed the need of exploratory experimentation. He had interpreted only in part the meaning of the Sophist movement and its world-wide ramifications which were to come in the ensuing centuries and to ripen into the more or less concrete and practicable present-day pragmatic system of problem solving.

Socrates had his enemies, among whom were what might be called the vested interests of the Athenian teaching element. From those persons who enjoyed some prestige or financial benefits from the source of instructing, there came persistent, acrimonious complaints to the effect that Socrates was corrupting the morals of the young men and that he was influencing them to defame the gods and to do other illegal acts. On these trumped-up charges they succeeded in bringing him to trial. The trial jury in Athens was composed of a very large body of citizens who voted their findings. The case before the court evidently seemed rather petty to them, for, as was the custom in dealing with unimportant cases, they asked Socrates to fix his own sentence.

Socrates was old and very ungainly, so he may have preferred to die at this time. At any rate, he made a most sarcastic address in which he declared that if they did justice to him, they would apologize and give him a pension for life. This shocked the jury and in the moment of uncertainty when the crowd didn't know what to think, his enemies seized the psychological moment, and haranguing the jury in a most disgraceful way, they convinced them that he had not only insulted the jury but that such action was impious and certain to bring the wrath of the gods

upon Athens if she suffered him to continue in such malevolent procedure.

They succeeded so well at infuriating the jury that it voted the death sentence for Socrates. The story of his confinement and final drink of hemlock is a classic in stoicism, but aside from its influence upon the morale of his principal disciples it has no bearing upon this theme.

2. **Plato** (427–327).—The immediate educational heir of Socrates was young Plato, a very rich disciple of the master. We know little of his early life, and but the skeleton of his later career, for he was above all else a supermodest man. It is certain that he could have enjoyed a public career and wielded great political power had he chosen to do so, but he preferred philosophy to all things and spent his days in teaching and speculative thought.

Our first debt to him is for his service in preserving in written form the great teachings of Socrates. We shall never know how much credit really should go to Socrates and how much to Plato, the "rewrite" man. Plato chose to attribute this great wealth of wisdom to Socrates, and an undiscriminating world has taken him at his own word. His unassuming nature may have robbed him of much of the glory that should be his.

In the "Republic" and the "Dialogues," where, as before said, is the reported philosophy of Socrates, and in his later work the "Laws" we have the educational philosophy of Plato. To him the aim of education was to give to both body and spirit all the beauty and perfection possible. In his own words: "Education is the vestibule of complete living." He believed in complete state control of education, even to the extent of removing all children from their parental homes,[1] in the education of women, and in selective education of all children. That is, by a process of selection, he would educate the various grades of ability for the life work for which they were most fit. This theory recognizes our modern idea of individual mental differences.

It is important to note that Plato's "Ideal State" was the first scientific plan of education ever proposed in permanent written

[1] In the "Laws" he retracts this suggestion.

form. It has served many centuries as a source of rich and valuable suggestions.

3. **Aristotle.**—As Socrates had taught Plato, so Plato taught Aristotle. The father of Aristotle was the physician who attended the family of King Philip of Macedonia. In this way, Aristotle was thrown into the company of the young son of Philip who, upon his father's death, was destined to conquer the world and become known as "Alexander the Great." As Aristotle was some years Alexander's senior, Philip hired him as the boy's tutor. One can well imagine that there, indeed, was a real problem in discipline. The boy was scarcely more than a savage, capable of little or no self-control over his cruel and violent emotions. Yet, somehow, mind prevailed, and the man who was destined to become the conqueror of Philosophy and rule for ages in the realm of thought, had in large measure the respect and confidence of the one who was destined to have such a meteoric rise to fame as conqueror of the temporal world.

Nor was the teacher's conquest of the student to have the tragic end that is so often true, for Alexander remained a lifelong friend of his teacher. In fact, he assigned 800 gold talents, a sum of about $4,000,000, to Aristotle for the purpose of research and museum founding. This great sum made it possible for Aristotle to hire a large corps of clerks and students whom he set to work gathering not only wisdom, but all sorts of natural history specimens and to cataloging and systematizing this accumulated data.

From this great mass of material he compiled the "Organon," a cyclopedic work embracing the then known knowledge of the world. This body of information served until recently as the almost undisputed last word of wisdom. It took modern scientific methods and scientific implements to wean the world away from the idea that wisdom died with Aristotle.

He had done a great work, but as he was the first real scientist, it was but natural that many of his findings should be erroneous. Furthermore, his method was almost wholly that of observation. Measurement in most cases was impossible for want of measuring instruments. He had but the compass and the ferrule. His

simple experiments could not be the concise, controlled, and hypothetical work of today. But our debt to Aristotle is not thereby lessened. He may well be called the "Father of Science."

II. ROMAN INFLUENCE

In 146 B. C. the Roman legions overran the devitalized Greek people, reduced the state to a Roman province and carried away many of the most enlightened Greeks into slavery. Compared to the Greeks, the Roman conquerors were of a much lower cultural stage so that these enlightened slaves soon exercised a very important influence upon the nation of their captors. In fact, it has been said that the great Roman military machine in reality became little more than a vehicle to spread Greek learning.

The Romans produced one outstanding teacher, Quintilian. He is noted, among other things, for being the first school teacher to have received a salary from the state, for being the first Roman to deal scientifically with education, for being the first ancient educator to defend public education as against private, and for the important bearing his work had upon the later work of Herbart.

Education as practiced among the ancient nations fostered class distinctions. Only the privileged few, except among the Hebrews, were educated, the great masses were uneducated. This prevented progress and caused their nations to become and remain static. Their teachers, such as they were, were untrained and their aims were to subordinate the individual wholly to the state. Their methods were systems to memorize the subject matter, reason and understanding being of no importance as they looked at it. Their content was authoritarian in origin. That is, it was merely the opinion of some revered person and hence it was almost wholly untested knowledge.

With the fall of Rome at the hands of the Germanic barbarians, education ostensibly disappeared from the face of Europe. Many of the educated men, however, betook themselves to the refuge of monasteries and there continued to study in seclusion. It was in those retreats that the ancient manuscripts were hidden away and copies made. From their influence small schools later sprang up and were followed by the medieval universities. In

the latter institutions the so-called schoolmen taught. Their subject matter was largely metaphysical, hence incapable of being tested, with the result that their ideas often became fantastic.

Modern times were heralded and hastened, if not caused, by a number of discoveries and inventions. Among the discoveries was that of Copernicus, that the sun is the center of our solar system; that America lay across the Atlantic; and that much valuable merchandise could be had from beyond the Hellespont. The inventions included gunpowder, the mariner's compass, movable type, linen paper, the telescope, and logarithms. Along with these, and partly as results, went the decline of feudalism, the crusades, the rise of free cities and the subsequent development of the modern state.

III. DANTE BEGINS WRITING IN THE VERNACULAR

The next great step in the development of education is Dante's (1265–1321) departure from the old practice of writing in Greek or Latin. He effectively broke the precedent and wrote in the Italian language. This was the real beginning of the "rebirth" or renaissance of learning. Men and movements followed fast. Among the latter are the humanistic movement, the protestant reformation, the catholic reformation, the realistic movement, with its humanistic, social, sense, and verbal realisms as the several varieties. Each movement had its ardent champions—but surveyed without too much sympathy, they seem to be chiefly a state of flux, the leaven, if you please, out of which something important might or might not develop.

IV. THE DOCTRINE OF FORMAL DISCIPLINE

By the middle of the seventeenth century it seemed most possible that nothing much in the nature of progress was destined to be born; for by that time John Locke was laboring to generalize the findings of these several movements into the so-called "formal discipline doctrine." So well did he do his work that this half truth choked the germ of life almost out of educational growth for some 250 years.

By this doctrine it was believed that the mind could be whipped into a state of great keenness, and thereby be ready to cope with any and all problems, by virtue of the fact that all knowledge of whatever sort would transfer from one life situation to another, no matter how remote or unrelated, and, by sheer force of mass, enable the educated man to solve all problems capable of solution. While this doctrine as such is false, or as before said, is at best but a half truth, yet it has played such an important part in things educational that it should be thoroughly understood. The doctrine of formal discipline was, up to the nineteenth century, the most definite principle or philosophical statement of what were thought to be the underlying facts of education. As intimated, it has enough truth in it to make it seem rational, and, if it were actually true, it would be the greatest boon that mankind could ask. Consider how valuable education would be if everything we learned would directly, or even indirectly, apply toward our efforts to solve any and all of our problems! Think how economical such a condition would be! In fact, such a state of affairs would be so acceptable that it is easy to see that the hope it held was father to the belief in it. So potent is the desire among men for such a panacea that the ground is not entirely clear to this day, and many there are who know no other more acceptable principle. A late vice president of the United States, in his autobiography, declares his full faith in this doctrine. In praising his alma mater, a certain classical school, he says that Latin and Greek are like whetstones: you whet your mind on these stones; then, like the knife on which none of the stone remains but leaves it sharp, so your mind will probably retain none of the Greek or Latin, but will be sharp and cut directly to the point in your life problems. In this respect, consider how much the Latin he might know would aid a doctor in performing an operation for appendicitis, or an automobile mechanic in changing the timer on a Ford.

V. THE NATURALISTIC IDEAL

The next philosophical theory of education to hold the center of the speculative stage was that of the so-called "naturalistic ideal" of the seventeenth and eighteenth centuries. By this

conception, education is based upon the processes of nature; and, natural processes determine both subject matter and method.

Sir Francis Bacon (1561–1626) is rightly placed as the very earliest of the exponents of this school. He was a graduate of Cambridge, rich, and a favorite of Queen Elizabeth. He aimed to investigate the whole field of knowledge to determine what was already known and what still remained as either unknown or inadequately known. He divided his method into three parts: (1) investigation, (2) experimentation, (3) verification.

Feeling that Aristotle, an ancient, was unduly accepted as final authority he decided to rewrite in encyclopedic form the whole body of knowledge, but finished only two sections of it. Copying Aristotle further, he wrote the "Novum Organum" in an attempt to explain his application of induction to scientific methods. He was not over-modest as evidenced by his own words: "I have held up a light in the obscurity of Philosophy which will be seen centuries after I am dead."

Bacon was followed by and to some extent influenced the following "naturalists": Comenius, Francke, Rousseau, and Basedow, of whom Rousseau was to become at least most conspicious, if not most important.

As a very young man, Rousseau (1712–1778) won a prize given for the best essay on educational matters of the day. All other competitors for the prize took the position as protagonists of the education then in vogue. Rousseau, however, set about to criticize severely every phase of it. His lone position no doubt was a great asset to him in that contest. It is not difficult to imagine the judges, much perplexed as to the relative merits of many excellent essays, all perhaps so much alike in thought and praise, deciding that Rousseau's opposite views seemed to mark his work as of different caliber. At any rate, it was the way out and he was awarded the prize. This experience seems to have convinced him that success as a writer might best be sought on the unpopular side.

Whatever the causes of his iconoclastic outlook upon life, he was destined to have a far-reaching and important influence upon education, to say nothing of politics and morals, for which he

has been called the evil genius of France. Napoleon credited him with causing the French Revolution.

Rousseau believed that "Everything is good as it comes from the hands of mother nature; but everything degenerates in the hands of man." With this thought in mind, he outlined his ideas of matters educational in a book, "Emile," as a sort of half novel and half philosophical manuscript in five sections or books. It is the story of a boy taken into the woods and country and there allowed to educate himself, his companion being a tutor who does nothing more than help the boy answer his own questions.

It is easily seen that, by such a procedure, the entire youth of the boy would be virtually wasted in learning relatively few of the things that might be quickly and safely taught to him. Trial and error learning is justified only when there is no way to learn without error. This is true in two general classes of cases. Those cases in which one is acquiring a given skill, such as learning to ride a bicycle; and those in which someone is experimenting to find new knowledge or better ways of doing things than are known, are examples.

In brief, Rousseau's ideas of education are wrong as to organization of subject matter, method, theories of transfer, punishment, psychology, social influences, and education of women. Rousseau was a professional writer, and an educator quite incidentally. Consequently, while wrong in practically every exposition which he essayed, yet his influence has been tremendous. The reason is that many of his sentences are epigramatic and as single statements, isolated from the theory which they were designed to nurture, frequently contain suggestions for educational practice.

Much of Rousseau's philosophy culminated in G. Stanley Hall's "Nature Is Right Doctrine," which has been effectively and, it is to be hoped, finally exploded and replaced by the utility theory of Thorndike.

VI. THE PSYCHOLOGICAL MOVEMENT BEGUN

1. Pestalozzi.—Among the intelligent readers of Rousseau's "Emile" was Heinrich Pestalozzi (1746–1827), the man who was

destined to become the first teacher to use, in any large way, what has now become known as the psychological method of teaching. It is not to be understood that he consciously used the laws of psychology or that he even knew of their existence. The fact is that the laws of learning are natural laws of man's original nature. This being the case, man lived, in very truth he was obliged to live, subject to their operation just as he was obliged to live subject to the operation of the laws of gravity, before they were discovered and stated by Newton. These psychological laws, being native, could be used by teachers in a degree somewhat commensurate with the extent to which the teacher in question might be said to have native or acquired sensitivity to human concern. Or attempting to put it more simply, the so-called "born teacher" was, or perhaps is, a person who has an unusually keen sense of "feeling tone" for the conditions which must obtain in order that the learning process may go on. Such a sense is most certainly a tremendous asset to a teacher but it is likely to be a blind sense, as was the case with Pestalozzi. Moreover, valuable as this gift is, it does not preclude the possibility of competent students acquiring a scientific knowledge of the learning processes and the subsequent use thereof, and becoming excellent teachers, though not originally blessed with such an intensive social sensibility.

Fortunately, Pestalozzi was a rather voluminous writer so that from his books, "Leonard and Gertrude," "How Gertrude Teaches Her Children," "The Evening Hours of a Hermit," "A Journal of a Father," and others, we are able to analyze his procedure. In this way it has been learned that he taught, all unwittingly, very much in accordance with the laws of learning.

2. Herbart.—But we are not the first to attempt to analyze the method of Pestalozzi. The beginning of that task was made by one of his contemporaries, Johann Friedrich Herbart (1776–1841), a graduate of the University of Jena.

When the fame of Pestalozzi reached him, Herbart journeyed to Pestalozzi's school for the purpose of observing the Pestalozzian project. The best authority tells us that Herbart remained but one day and then hurried home to write a book in which he

explained, to his own satisfaction at least, just what Pestalozzi was doing. This explanation is quite well known to the world as Herbart's, *four formal steps*. Careful study of this arouses the wonder whether or not Herbart really wasted a day; for these steps are merely general statements of what anyone does when confronted with a variable task; and they are not even very good general statements. They are: (*the formal steps of instruction*): (*a*) clearness—the sensing of an individual presentation; (*b*) association—combination of the relative knowledge from apperceptive basis with the new knowledge just presented; (*c*) system—organization of the general notion or concept from a group of particular percepts; (*d*) method—the application of the concept, or general notion, as a measuring rule or standard of measure.

Those who may wish to anticipate the drift of this chapter may see in those four Herbartian steps a very crude attempt to state the laws of learning. In a way, these pseudo principles were the beginning of our modern professional literature in the field of education. With this professional literature the disciples of Herbart soon built up a following and may be said to have been the first to give professional training in education. From America there went many to study the Herbartian Doctrines. Among them, and perhaps the most famous, were Frank and Charles McMurray, and the DeGarmo brothers. With all the enthusiasm of youth and the intoxication of new truth, these students returned and introduced the cult into America. As often happens with such movements, and as was certain to happen to this movement because of its general, theoretical, and non-specific nature, it rather swiftly declined to a state of more or less formalism. Nevertheless, it remained as the outstanding professional subject matter of the normal schools until the rise of Thorndike; and in fact, has not wholly disappeared even now.

3. **Froebel.**—There came to Pestalozzi's school another young man, Freidrich Wilhelm Froebel. Young Froebel was already a scientist of some note, having been trained as a forester. This training had given him the technique for attacking the scientific study of a problem. He knew that no worth-while scientific

conclusion as to the value of Pestalozzi's work could be reached through the method used by Herbart. Froebel's scientific mind told him that such an analysis must be reached by piecemeal study of the problem. That is, a small phase of the larger problem must be isolated, the variables controlled, and the elemental facts learned by painstaking experiment and verification.

With this in mind Froebel asked for and received from Pestalozzi a position as a teacher in the latter's school. There he taught for a year or two under the guidance and supervision of the great master.

In the course of time Froebel reached his decision to study the very young child. This no doubt was because he wished to study the learning process as closely to the natural state as possible and thus avoid the effects of the wrong sort of teaching which would likely prevail in older children. To the group selected he gave the name "kindergarten children."

The literature of Froebel's work is so ample that we need only point out the basic essentials. (*a*) He strove for a pleasant setting, richer stimuli or equipment, and greater stress to secure whole-hearted participation on the part of the children. This is something more than attention. It is in fact application of the law of readiness. (*b*) He stressed the need of "learning to do by doing." Here again is much of the law of exercise. (*c*) He did not neglect the law of effect, though he perhaps did not realize its import so fully as those of the first two principles. However, his idea of "gifts" and his great concern for the contentment of the children are unmistakable signs that he was very close in practice to our present ideas of the law of effect, and not much farther from it in his theoretical statements of what he believed to be fundamental.

Today Froebel's ideas are found in practice in every city in America that can afford a kindergarten. This great universality is evidence of his successful solution of the problem to which he gave his time and energy.

Herbart had given us an organization of Pestalozzi's work which he reached by the processes of abstract philosophy, arm chair philosophy, if you will. Another of those attempts so often

made during all ages in history, to stratify knowledge into formalism. Such an aim seems to be the utopia of thinkers. They, somehow, hope to find an easy key, or solution, to great and complex problems.

Froebel, on the other hand, gave us the organization of a small section of Pestalozzi's work, having reached that organization by experimental and tested facts. His work was done in great detail. Its continued life and great growth, as against the slow demise of Herbart's work, is evidence of the superiority of his contributions and of his methods of procedure.

4. **Edward Lee Thorndike.**—Into our story at this time comes Edward Lee Thorndike. Following the methods of Froebel, Thorndike checked the thoughts and findings of his predecessors and contemporaries by tireless experimentation. This done, and thoroughly convinced that when all variables are controlled immutable law lies at the bottom of all learning, Thorndike set about to state those laws in better form than they had hitherto been stated.

It must be remembered that Thorndike did not create the laws of learning. They are natural laws; they are as old as, if not older than, man. They will remain. Man must, whether or not he so prefers, live with and abide by these laws. Also, it must be remembered that Thorndike did not even discover them. The evidence has been given which shows that Froebel was conscious of their existence. If more is needed, such ancient adages as the following may be cited: (*a*) No one can succeed who is not interested in his work. (*b*) Practice makes perfect. (*c*) A task well done is its own best recompense. Virtue is its own reward.[1]

What Thorndike did was to clarify these ideas, strip away the false notions that had attached themselves to the principles, and finally state them as laws in comprehensive form.

This does not minimize Thorndike's services. Conceived in this light alone, can they really be appreciated. Had he sat in a library and spun elaborate theories based on opinion—even the best opinion—his work would have resembled Herbart's. But

[1] Compare (*a*) with readiness, (*b*) with exercise, and (*c*) with effect, in Chap. III.

this he did not do. He first learned the facts—the status quo of those facts—and then showed how they function.

His final statements may be had in his three volumes or his "Briefer Course in Educational Psychology," where they are set down under the heads of the laws of: (*a*) readiness, (*b*) exercise, (*c*) effect. Supplementary to these three are the five statements which he calls the five subsidiary laws of learning: (1) multiple response, (2) mind's set or attitude, (3) partial activity, (4) assimilation or analogy, (5) associative shifting. If these five so-called subsidiary laws are thought of as variables which affect the three major laws, it will be easier to understand their import.

It must be remembered that Thorndike's statements of these major and secondary laws are not necessarily in absolutely final form. At any time, someone may further refine his verbal conception of them. But the principles involved are permanent and there is neither immediate nor remote possibility that they will be abrogated.

True it is that some writers seem to feel called upon to "overthrow" these laws. But a careful reading of their essays will show them to be operations performed on straw men. Some of them indicate a lack of understanding of the Thorndikian language, which, indeed, is sometimes indirect. Some of the most popular of these criticisms are merely elaborations of the "law of associative shifting" and have been written at great length to explain what this law and a few explanatory statements makes perfectly obvious.

The writers believe with Thorndike[1] when he says:

> Moreover, no matter how subtle, complicated, and advanced a form of learning one has to explain, these simple facts—the selection of connections by use and satisfaction and their elimination by disuse and annoyance, multiple reaction, the mind's set as a condition, piece-meal activity of a situation, with prepotency of certain elements in determining the response, response by analogy, and shifting of bonds—will, as a matter of fact, still be the main, and perhaps the only, facts needed to explain it.

[1] Thorndike, Edward L., "Educational Psychology," Vol. II, p. 16. Quoted by permission of the Bureau of Publications, Teachers College, Columbia University.

While the fundamental principles expressed in these laws are certain to remain basic to sound learning method, it does not follow that they cannot be elucidated by a rich variety of experimental application. As a matter of fact, much valuable research has been made by numerous competent students of psychology, so that at present there is available a very comprehensive literature which greatly elaborates these basic principles.

Problems and Exercises

1. Of what value is a connected story, such as this chapter, of the main channel of educational development from ancient times down to the present?
2. The greatest problem of modern education is, "What to teach." Why?
3. If the doctrine of formal discipline were true, what advantage would it be to us?
4. Conservative thought has generally opposed innovations. Why?
5. Pestalozzi is grouped with Herbart, Froebel, and Thorndike rather than with Rousseau or Locke. Why?
6. Distinguish between pragmatic thinking and any other varieties which you can name. In which group do you include Thorndike's works?
7. What is Thorndike's outstanding contribution to education?
8. Give full illustrations of each of the five subsidiary laws of learning. Why might they be called principles of variability rather than laws of learning?
9. From this chapter show why education may be considered as a science?
10. Is there a general scientific method, or must each problem have an individual method?

References for Further Study

GRAVES, F. P., "A History of Education—Before the Middle Ages," Chap. XII, The Macmillan Company, 1923.

GRAVES, F. P., "A History of Education—During the Middle Ages," Chap. XIII, The Macmillan Company, 1923.

GRAVES, F. P., "A History of Education—In Modern Times," Chaps. II, V, VII, X, XI, The Macmillan Company, 1923.

MONROE, PAUL, "Source Book of History of Education," Part I, Chaps. III, IV, Part II, Chap. VII, The Macmillan Company, 1921.

MONROE, PAUL, "Textbook in the History of Education," Chaps. III, V, IX, X, XI, XII, The Macmillan Company, 1926.

ROBINSON, J. H., "The Mind in the Making," Chaps. IV, VI, Harper & Brothers.

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GRAPHICAL SUMMARY OF CHAPTER

At the end of this and each succeeding chapter will be found a "flow chart" which is designed to give a graphical representation of the material presented. In each of these charts the "flow" is downward, that is, it is to be read from top to bottom.

To facilitate the use of these charts an interpretation of Fig. 1 follows. Educational consciousness begins in reality with the Greeks, the leaders of whom were Socrates, Plato, and Aristotle. We may classify Socrates as a pure philosopher, Plato as a system organizer, and Aristotle as a content organizer. The Roman military machine conveyed the contributions to the occidental world. The next development was Dante's writing in the vernacular, resulting in the production of a multiplicity of books and a flood of educational theory, which John Locke attempted to interpret, giving to the world the doctrine of formal discipline. Rousseau rebelled against this doctrine and advocated naturalism. Pestalozzi tried naturalism, gave it up, and began the psychological movement. Herbart attempted to standardize this and gave us the "four steps." Froebel took another point of view and was the first to apply scientific methods to the psychological movement. He was followed by Thorndike who, in a way, completed his work by formulating the laws of learning.

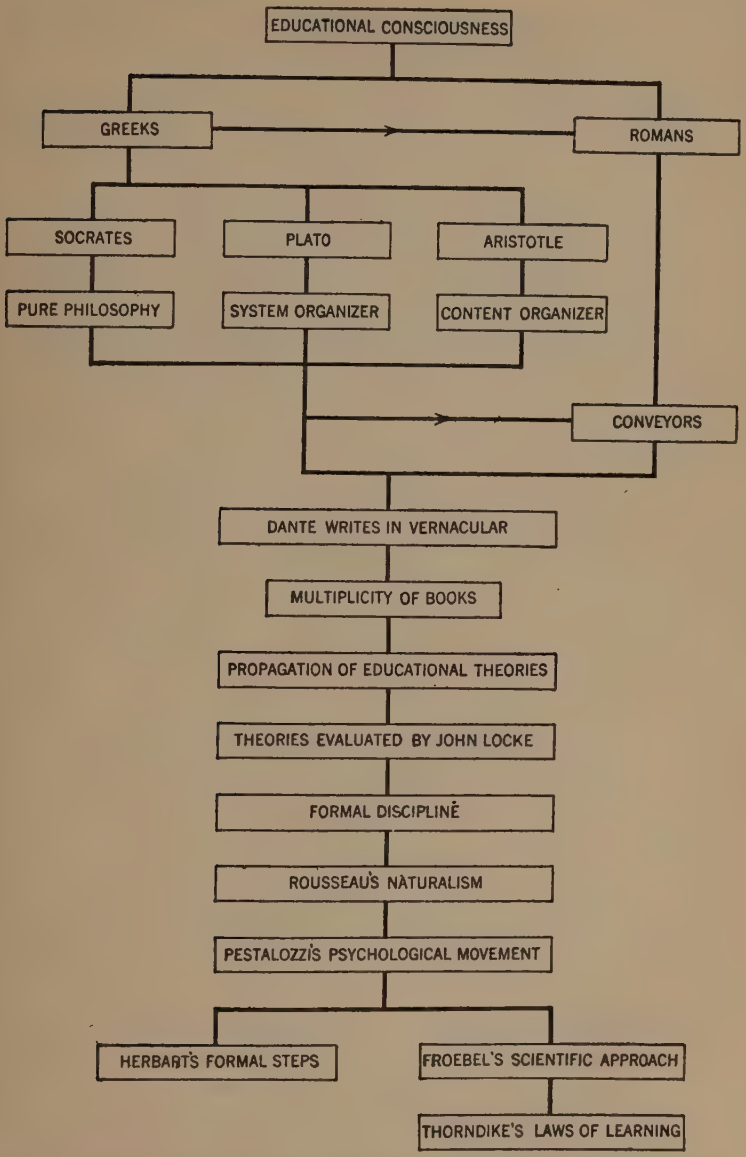

Fig. 1.—Graphical representation of the content of the chapter, Stages in the Development of a Modern Philosophy of Education.

Chapter II

ESSENTIAL SOCIAL OBJECTIVES

I. SOCIAL OBJECTIVES IN EDUCATION

1. Statement of Aims the First Requirement of Good Teaching.—In order for one to be successful in any pursuit, a clear definition of aims and objectives is of primary importance. A definite conception of goals acts as a selective process, sorting out the productive activities from the unproductive. A business concern which does not have its force organized and directed toward well-defined goals must soon fail. A fraternal organization or club which exists for no particular purposes sooner or later passes out of being. Even life itself must be focalized upon definite purposes to be well-rounded and worthy. It is so with teaching; we must have a definite, clear-cut, well-defined philosophy to make it function to the fullest.

But too often in our present-day schools there seems to be an insufficient understanding of the potency of this great guiding force. Perhaps it is an exaggeration to say that aims are missing, but of the types present we find an undesirable variety with little uniformity in their application. It is obviously true that in the education of "all the children of all the people" throughout the nation there should be a great underlying similarity in the objectives, for if we are not already so, we are fast becoming a closely knit people with needs quite definitely constant.

The situation is, however, that we are sadly deficient in a more or less uniform philosophy. It is quite general to find local educational systems setting up their own, and thus the whims of individual communities determine the educational policy of their respective school systems. It is further true that we often find evidences of outworn, threadbare aims of education. We are still clinging to traditions which we have inherited, in some cases, from the beginning of our national existence. We have

been reluctant to change, for the wheels of progress, and particularly educational progress, move slowly. The most casual observation in almost any American classroom will reveal the great confusion of objectives extant.

II. EARLIER CONCEPTIONS OF EDUCATION

1. Education as Preparation.—There are really two aspects to the preparation aim of education. The first is education as a preparation for higher education, and the other is education as a preparation for life. As we shall see, both of these phases had, and to some extent still have, a dominant place in the control of educational policy. Each of these aspects will be discussed in order.

The first American schools started from the top downward. Early American history shows that the controlling passion of our colonial forefathers was religion. With each band of heroic settlers came its group of men of the cloth who directed the moral and religious activities of their followers. But it was very quickly recognized by the colonists that the services of these men of God would some time or other cease, so the necessity of training others to take their places became apparent. To meet this condition Harvard College was established in 1636. The first matriculants of this institution were young men who had been trained in England for their more advanced collegiate instruction.

This established a new problem, for it was recognized that to maintain a college there must be a continual influx of students, thoroughly prepared to carry on the arduous duties of higher education. Thus college preparatory schools followed next in order. These schools, known as the Latin Grammar Schools, necessitated the organization of still lower schools whose function it was, in part at least, to prepare students for the Latin Grammar Schools.

Hence we see that each of the lower schools was in general a preparation for the next higher. An analysis of existing conditions shows that we have not outgrown this phase of the preparation aim for we still, to some extent, think of grade-school training as a preparation for high school and high school as pre-

paration for college. There are some communities indeed which entirely ignore the fact that many of its grade students will, because of economic reasons or others equally potent, never reach the secondary school. Unfortunately, no special training is given this group of children; the attempt is to cast them in the same mold with those who are preparing for more advanced work. It is still less uncommon to find high schools whose entire plant, equipment, and curriculum are built upon the basis of college preparatory requirements, completely overlooking the needs of that vast army of boys and girls who do not plan to take up higher education and who soon leave school because of curricular inadequacies.

Continuing with our historical consideration, we find that as we emerged from the colonial period we gradually broke away from the religious dominance of the schools. With a little more acceleration we evolved the conception that education was a preparation for life. This was stimulated by the rapid growth of cities and the increased development of manufacturing in the period around 1820. As these cities developed, the problems of living became increasingly complex and the individual's adjustment to these changing economic conditions grew correspondingly more difficult. Increased knowledge was a necessity in order that the complexities of life could be met with greater efficacy. The demands for fundamental knowledge necessary for well-ordered and successful living grew in great proportions.

Increased manufacturing, also, brought its need for more knowledge and skills, for to deal adequately with the requirements of this great manufacturing era one constantly had to enlarge the extent of his learning. During this period, more than ever before, the working adult was required to know the fundamentals of number work, for it became part of his stock in trade. Reading was a necessity. Even in the lower types of industrial work, knowledge of the principles of commensuration was needed. Increased interest in transportation brought about the need for some knowledge of geography. The demand for knowledge kept pace with the rapid industrial growth.

The logical result of this growing demand for more information was the organization of the schools to give this equipment.

Thus, at this time, the aim of education, at least for the masses, was training for the participation in adult society. Schools were not interested in the problems of childhood, they were concerned only with the task of "educating" children for adulthood. Childhood was a mere apprenticeship for mature life. It was the hope of these schools to furnish the child with a great store of ready made information which would function later when he took his place in society.

We are not entirely free from this aspect of the preparation aim of education at the present moment, for is not the traditional curriculum built largely upon the basis of extrinsic values? In a certain state syllabus for sixth-grade arithmetic, for example, we find such topics as discount, profit and loss, interest, and many other processes equally advanced. What twelve-year-old child has occasion to use these intricate phases of business procedure in his everyday life? They are, obviously, not in the curriculum to train the child for his immediate needs but rather to equip him with knowledge and processes which will be of use at some future time during adulthood when the needs for them arise. If such training of an extrinsic sort were operative when the time for its use occurred, then education as a preparation for life would be justifiable. In reality, however, we find but little or no transfer of training of an extrinsic nature to a solution of life problems. The time devoted to such study is largely wasted for, when the demand for its use presents itself, the child has long since lost the knowledge.

A single illustration is sufficient to demonstrate the validity of this statement. The writer was at one time teaching physics to a class of high-school seniors who had, of course, satisfactorily completed all of the work of the elementary grades. A problem was given this class which, in its solution, demanded a knowledge of extracting the square root of a number. This material was taught in the seventh grade of this school system and beyond doubt each one of the group had at one time mastered the process. Yet, when the need for its use arose, not one of the students had remembered the first principles involved. This is, indeed, but one of an infinite number of illustrations which may be given to demonstrate the futility of teaching children either

knowledge or processes with the idea that these will function at some future time when the need for them presents itself.

2. **Disciplinary Conception of Education.**—This theory, as was mentioned in Chap. I, was based on the assumption that subjects are taught not for their intrinsic worth but for the mental training accruing from their study. It was once thought that the mind was divided into compartments or faculties such as those of attention, will, memory, judgment, and others. Thus every time we memorized any content we "exercised" the faculty of memory, so that "like a muscle" it would grow in power. Studies were pursued so as to strengthen these faculties. While we believe that transfer under given conditions is possible, modern psychology has completely disproved the theory of formal discipline.

Yet in face of the great mass of conclusive evidence against formal discipline, we find that many of our schools of today still cling to the theory. In fact, there are many teachers who attempt to justify some of the subjects of our various curricula on this basis only. In the minds of many, Latin and mathematics, the storm center of some modern criticism, owe their existence quite largely to the place they are supposed to occupy in the "mind training" of youth. If this were the only basis upon which mathematics and Latin could establish their worth in the modern curriculum, their inclusion would be indefensible. The writers do not take the position that these subjects should be eliminated, for they feel that they have worthy functions to perform if taught in the right amount, to the right students, and in an effective manner. There is no need to attach fictitious values to them.

3. **Education as the Accumulation of Knowledge.**—The basic assumption of this conception of education was that the mind is a reservoir to be stored with knowledge or information. The use of this information was indeed a secondary matter. The more facts a person had accumulated the more highly educated was that individual. True, this encyclopedic theory might lead to an unadjusted recluse, but no matter, he was stamped as educated.

It might indeed result in many types of social instability but, regardless of this, knowledge was considered power, and the more of it one had the higher was his degree of education.

We have not outgrown this absurd view in our present-day schools. The cramming of facts is still in evidence at all turns. A mere peep into any classroom, particularly just prior to a final examination, will convince one beyond doubt that the mastery of facts is still considered one of the big objectives. Applications of subject matter are not stressed; uses are ignored; students must know the facts at all costs.

Of course, such a conception is ridiculous. Experimentation teaches that such factual information is retained only long enough to "pass the course." A high-school teacher of algebra, in exasperation over the inadequacies of her class in arithmetic, expressed this condition in the statement, "You have passed arithmetic and thus I do not expect you to know anything about it."

And so we could go on pointing out other outgrown aims of education to which we are still clinging in our present-day schools. There seems to be a great confusion of aims. Too many teachers are performing like rudderless ships, floundering about hopelessly, with no well-charted course. The writer conducted a series of individual conferences with about forty experienced teachers of recognized ability. During the course of every conference he asked each one this question, "Specifically, what is your conception of the aims of education?" In almost every case the teacher so questioned became confused, demonstrated great embarrassment, and finally answered by giving some intangible generalities which could not in any way serve as a guiding policy in her teaching. Not one of the group had definite, well-defined aims; each was just "teaching"—so-called.

The first question was quickly followed by another which was, "What are you attempting to accomplish in the teaching of your subject?" Again followed great confusion and much uneasiness on the part of the one questioned. Some had not the slightest notion of the functions of the course of study they were teaching in the education of their pupils.

This is indeed an alarming condition. It is our purpose in this book to give first a brief interpretation of modern educational aims, and to make the attempt to develop a working formula for their use in our schools, organized as they are at present. The authors hold no brief for this present type of organization for they feel that it is not adequate to meet the demands of growing educational tendencies. They will endeavor to suggest procedures which will be operative in existing situations with the hope that they will tend to neutralize the disadvantages accruing from our educational lethargy. In time, conditions will gradually right themselves. But judging from the rate at which advanced educational theory has been put into actual practice in the past, we are safe in assuming that the reader will, for some time to come, be confronted with a more or less traditional type of organization, which our plan of attack will meet.

III. PRESENT DAY CONCEPTION OF EDUCATION

1. Education Is Life.—At the present time we have arrived at a point in our conception of education where we feel that the only valid preparation for life is *living*. If we consider the child as an individual with real problems to solve and proceed to teach him how to solve them, he will be prepared to meet the exactitudes of adult life. The problems of childhood and those of adulthood differ not so much in kind as in degree. The demands on adult life are complex, but not more so to the adult than are the problems of childhood to the child. Bonser says:

> If the school devotes its work to furthering the normal activities of childhood, as these reflect the social needs and interests of life in its complex whole, then each day's participation is both a realization and a preparation. The problems of the day are met through learning and using whatever they require, and many similar situations in the future will call for material and method which will be much the same. Each experience is, also, in some degree a means to some other which follows. Life is ever broadening through new experiences. In degree, intensity, and breadth, adults have problems and needs very much beyond those of childhood, although they differ in kind almost not at all. Children increasingly learn of these problems and are interested in them . . . This does not mean that the children are asked to take an interest in a

problem *because* it will appear in their own at some future time, but because it is a real problem to them *now*.[1]

At the present time, however, we cannot follow Bonser's suggestion in its entirety because of our educational organization. Of course, we must at some future time come to it if we would really hope to educate efficiently. But, at present, our schools are not yet ready for this advanced type of teaching. What we can and must do, though, is to develop teachers who are trained to incorporate as much of our modern conception of education as the limitations of our present educational "set-up" will allow. We must, necessarily, accept our present curriculum made up as it is of separate subjects and endeavor to utilize it as a basis for the solution of some of the problems of childhood. We are forced to consider courses of study as the vehicles of the elements to be used in the solution of these problems.

Our task then, obviously, becomes one of socialization. But, unfortunately, this term which has come into quite general use has but little significance because it is so general in its scope. Just what is meant by a socialized individual? It must mean, of course, that he is adequately adjusted economically and socially to his environment. But here again we are dealing with generalities which may mean much or nothing at all. To instruct a teacher to "socialize" his children is to give him a task the limits of which are undefined. He needs a definite working formula; one which he can take into the classroom with him to guide him in his efforts.

It is our purpose to break up the term "socialization" into its component parts; for by such an analysis alone can we arrive at a working basis for its use in the classroom. Herbert Spencer[2] gives us the first clue as to its meaning. He carefully summarized the properties of efficient living under five different headings which are: (1) self-preservation, (2) self-maintenance, (3) parental duties, (4) good citizenship, and (5) aesthetic culture. The more abundantly one is possessed of the knowledge of these

[1] Bonser, F. W., "The Elementary School Curriculum," p. 19. Quoted by permission of The Macmillan Company, publishers.

[2] "What Knowledge Is of Most Worth?"

elements of socialization the more adequately adjusted is that individual. The schools must supply the knowledge.

More recently an attempt was made to refine Spencer's analysis and make it more readily operative as a working educational formula. The Commission of the Reorganization of Secondary Education has, as a result of its study, given us what they have called the *Seven Cardinal Principles of Education.*[1] These cardinal principles have come to be the recognized fundamental aims of modern education, elementary, secondary, and higher. They are all inclusive of the elements of full-rounded, purposeful life. In fact they are so all inclusive that there is some objection to them on the basis of being too general. This objection is not well founded, for, if used correctly, they can be made a splendid guide in teaching.

IV. THE SEVEN CARDINAL PRINCIPLES

1. **Health Efficiency.**—Nearly one-third of those examined by the draft board were found to be unfit for military service. This seems to be truly typical of the general condition throughout the country, for those called were unselected and thus a cross section of the nation's condition of health was taken. This shows an alarming percentage of physical disability, most of which was, according to our present knowledge, preventable. As time goes on the science of healthful living is becoming more and more definitely established. We are already at a point in the development of hygiene where if certain well-established principles are rigorously followed, many years of effective living may be added to the life of the average individual. It holds true without emphasis that, other things being equal, one's personal efficiency is greatly enhanced by the possession of vigorous, virile health. This does not mean that one who does not possess a sound body must necessarily be a failure. In fact, we have a great many striking examples of physical weaklings who are the very personification of effectiveness. Such cases, however, are the exception and not the rule. In general, it is safe to say that a strong,

[1] "Cardinal Principles of Education," Dept. Int., Bur. of Education, *Bull.* 35, 1918.

healthy body coordinates well with efficiency; thus we should work toward that objective.

The increasing complexity of our present social condition is telling on the human system. The speeding up of life is burning up the tissues more rapidly than ever before. The high tension under which we are working is adding its bit of woe to the nervous system. Our types of amusements are softening, for they are becoming increasingly more of the entertainment variety, not calling for physical activity and generally not of the re-creating sort. We have hardly time to think of ourselves in our busy workaday world. But all of this means, of course, that greater stress than ever before must be placed upon the care of our bodies in order that we may resist the ravishes of these increasingly taxing conditions.

But who shall teach this conservation of health? The homes are not, generally speaking, equipped to do it. If parents should happen to see the necessity of such a form of parental guidance, more often than not they are "too busy" to take the time for it. The fact is, however, that relatively few parents are well enough informed in the modern conceptions of healthful living to give the needed instruction even if they should desire to do so. The challenge is squarely up to the schools. When the home ceases to give any necessary type of training the school must assume the burden, and it is not inconceivable that it can do more effective work along certain lines of child training than can the home. Its equipment, both material and professional, can be peculiarly fitted to function in an efficient manner.

2. **Command of Fundamental Processes.**—Of all the cardinal principles, this one is the least easy for classroom teachers to apply. It is not that the teaching of fundamentals is so difficult but the problem lies in determining which ones are to be taught. By the term "fundamentals" we are forced to think of that elusive undetermined mass of material which we so freely talk of as "minimum essentials." But what are the minimum essentials of learning? Thus far they have not been defined. Only by the most minute study of all phases of life over a period of a great many years shall we be able gradually to sift out those

essentials commonly needed by all. Once we learn what such essentials really are, the teaching of them will be relatively simple.

Yet if teachers sit back and await developments, a great group of trained experts will be withdrawn from the field of experimentation, which will retard progress along this line. Each teacher should plunge in and make whatever contribution he can in the determination of these fundamentals. We know for a certainty that there are fundamentals which must be taught. But not knowing which ones are most vitally essential we should expand the scope far enough in order to be sure that the minimum essentials are included. Gradually, by the method of trial and error, a teacher will arrive at some basis for a fairly adequate selection.

We know, certainly, that all efficient individuals must be able to read intelligently, write with rapidity and legibility, and speak and write the vernacular correctly and fluently. We are coming to feel that some degree of manual dexterity is a fundamental. There are certain facts and processes of arithmetic such as addition, subtraction, multiplication, and division which are now thought to be essential and still other branches of this subject which are in the category of the undetermined. Unquestionably some knowledge of history, civics, and geography is fundamental, but just what this is remains yet to be established. The same holds true for science and higher mathematics. But let us "carry on" and attempt to help solve the problem!

3. **Worthy Home Membership.**—Henry van Dyke says:

> The home is the seed plot and nursery of virtue. A noble nation of ignoble households is impossible. Our greatest peril today is in the decline of domestic morality, discipline, and piety.[1]

This is a challenge to society for, once the influence of the home becomes too greatly enfeebled, a severe blow will be struck at the heart of our social system. But one may rightfully question if this is not more a problem of the home than of public

[1] Van Dyke, Henry, The Powers That Be, "Essays on Application." Quoted by permission of Charles Scribner's Sons.

education. The answer is that it *was* a problem of the home, but it is more and more becoming a problem of the school. There is evidence to show that there is an increasing tendency to superimpose upon the public schools the responsibility of training home members.

There seems to be an abundance of data to indicate that there are some tendencies toward the disintegration of the home. The strong inclination toward commercialized amusements is drawing the family out of the home. This is true to such an extent that it is losing its place as the center of family life. The upward and downward extensions of education remove the children from home influences for a greater period of time. With the advent of the pre-school kindergartens, which take children as early as two years old, the duties of motherhood are slowly being transfered to the schools. The result of an increasing number of renters over home owners is instability. The development of city apartment life takes its toll. The increasing number of working mothers is another factor. All of these conditions and many others are tending to disrupt the influence of the home.

It is highly desirable that some effort be made to establish, to as great a degree as possible, the influence of the home. It should thus be one of our major purposes in education to accomplish this. To develop a whole-hearted interest in the home will bring large returns in socialization.

4. Vocational Efficiency.—As the spirit of our democracy increases, there is, and justly should be, a growing intolerance toward the parasite who lives but does not produce. There is, of course, a great temptation to some possessing economic independence to retire and withdraw their productive services from society. Then, on the other hand, there are those who are not particular about how they earn their livelihood and cast about picking up a living here and there in a hand-to-mouth fashion. Such conditions lead to social instability and in the end to an unhappy existence. The glory of work should be deeply and indelibly implanted in the minds of youth. Again, a wholesome respect for all types and varieties of work should be established in the attempt to quash snobbery.

Another phase of the problem of vocational efficiency is that of vocational guidance. Although authorities in this field assert that as yet it is quite impossible to predict with any degree of accuracy the vocational aptitudes of a child, yet much can be done in a general way. Our Junior High School movement has made the attempt by directing the students into what are called "exploratory courses." In a rather rough way some indications, at least, of a child's interests, if not aptitudes, can be determined. The task of guiding pupils is of tremendous importance, for one of the big elements of successful vocational pursuit is interest in the work.

Today we are placing much stress on vocational education in the public schools. In the cities we find many types of vocational schools. Even in the smaller systems located in the villages, splendid opportunities are afforded for students to make some start, at least, toward vocational participation. In many schools we find print shops, automobile repair shops, sheet metal shops, foundries, machine shops, drafting rooms, millinery shops, dressmaking shops, and the like, where real scientific training is given the boys and girls for these lines of work. Many present-day stenographers receive all of their stenographic training in the public vocational high schools which, in addition to this business training, gives them, as well, a splendid foundation in the so-called "cultural" subjects.

5. Civic Education.—This is, indeed, another of those elusive terms which may mean almost anything. It would not be difficult to think of it as including training in all those social virtues we have already discussed. The danger is that it may be made so inclusive that it will not serve any useful purpose. Hence, for our use, we shall accept the limitation of the term as determined by The Commission on the Reorganization of Secondary Education. They state that

> . . . Civic education should develop in the individual those qualities whereby he will act well his part as a member of the neighborhood, town or city, state, and nation, and give him a basis for understanding international problems.[1]

[1] Cardinal Principles of Education. Dept. Int., Bur. Education, *Bull.* 35. p. 13, 1918.

Our problem in this respect is, then, to train boys and girls to take their places as intelligent, cooperative members of the community, state, and nation. They must be trained in the art of getting along amicably one with another. They should be taught to take an active interest in social and political affairs and thus register an influence for good and for wholesome progress. Each individual must, in so far as it is possible, be made to feel that he has a responsibility in keeping true the ideals of our social heritage of American democracy. The additional obligation of actual participation in the administration of community policies should be established.

6. **Worthy Use of Leisure Time.**—The problem of using leisure is increasing in complexity. With the development of a machine-controlled, industrial world follows an increasing tendency to shorten the working day. In fact, the question of a "five day week" for workers is being discussed with much emphasis in some quarters of the industrial world. From an educational standpoint, this additional leisure offers a splendid opportunity if utilized advantageously, for it gives the individual plenty of time for self-cultivation. If, on the other hand, it be used unprofitably and in questionable ways, it may become a curse for it is a recognized fact that during one's leisure hours much character building takes place.

What activities one will turn to when the pressure of economic demands is released will be determined by the appreciations he has cultivated. If he has not been made to get a "thrill" out of the higher and better things of life, he will inevitably turn toward the base, for in the absence of learned reactions we turn to the native or instinctive. A good index of how we have, in the past, prepared men and women to meet the problems of leisure is the type and quality of the amusements now rampant throughout the country. It is not unusual to find the theatre of the risqué play packed to the doors, while that of a good wholesome production attracts hardly enough to pay its way. The magazines and books parading "sex problems" and moral perversions have their representatives as "best sellers" on the news stands and book shops. The popularity of jazz, and the discredit of classical music

so prominent in some quarters, indicates the trend. The vast number of people who cannot entertain themselves at home but must resort to commercialized amusements of inferior types is indicative of a lack of proper training.

The schools must develop appreciations of the right sort. They should give the boys and girls such an alluring experience in "the best the world has known and said" that an intense hunger for it develops. Unfortunately, it is true that much of the so-called work in the development of appreciations in our schools of today is farcical. Oftentimes more is done to kill real appreciation than to stimulate and develop it. But this is a commentary only on our teaching efficiency and in no way indicates that appreciations cannot be taught. They can, on the contrary, be developed by skillful teachers and it should be each teacher's objective to develop this skill.

7. **Ethical Character.**—The crowning attribute of effective living is ethical character. Those virtues of honesty, initiative, morality, integrity, responsibility, and the like spell worthy life, for who can be successful in the right sense without them? Ethical character is indeed a worthy objective, for all other character-producing agencies can be supplemented adequately by public-school instruction.

V. THE TEACHER'S APPLICATION OF THESE AIMS

1. **The Teacher's Major Function Is the Development of Fully Rounded Life.**—The question now arises as to how the teacher is to make application of these general principles of education. They stand as the elements of fully rounded, purposeful life. Now, how can they be made to play a significant part in the educational development of the child? The answer is that the teacher's effectiveness in using these principles of socialization is limited only by his lack of ability to interpret his course or courses in terms of them. To use a somewhat trite expression, we must come to the point where we cease to teach subjects and teach rather boys and girls. We must come to realize that the facts and processes of our courses of study are insignificant in com-

parison with the boundless opportunities they offer us in teaching children how to meet adequately the problems of life.

It should be the teacher's obligation to utilize the material of his course of study to the fullest possible extent in the accomplishment of as many of the social aims, and as much of each aim, as the limitations of this course will permit. Unless such material can be made to function in this manner, it cannot defend its place in the curriculum. And the more a course can be made operative in the attainment of the social objectives the greater the value we must attach to this course as an instrument of learning. The teacher must seek out all ways possible to serve the useful purposes of socialization.

Thus a teacher of mathematics has not fulfilled his obligations when he has taught the factual subject matter of his course alone. He has not discharged his duty until he has interpreted these facts into life in as many ways as are possible. It is not inconceivable to think of cases where mathematics may be used to teach ethical character. The writer observed the work of a mathematics teacher who taught an excellent lesson in the appreciation of truth by likening the precision and truth of mathematics to those of life. In like manner the teachers of history, geography, science, languages, and all the rest of the many different subjects found in our modern curriculum must seek out pertinent applications. Each course of study must become a veritable mine, a never failing source from which can be drawn those materials of use in interpreting purposeful living.

It must be said at this time that great care should be exercised to prevent making artificial adaptations. We must not attempt to make material function in ways which are, obviously, impossible and far fetched. Also, we must not feel that if we cannot bring out each of the various social aims we have suggested in the course of study we are teaching we are failing to function successfully. Some courses may be designed primarily to meet but one of the aims or at any rate few of them. Such is true to a great extent with music, which if taught correctly develops the profitable use of leisure time but which may tend but little toward the accomplishment of the other objectives. The same may be said about the home-making course whose major purpose

is the establishment of worthy home membership. There are perhaps others, also, which specialize in the attainment of one or another of the social objectives, but their position in the curriculum is justifiable because of the intensity with which they operate on that one objective.

2. Illustrative Cases of the Application to Be Made.—Let us consider the subject of biology to see how it can be made to function in the development of effective living. This subject is boundless in its opportunities to teach hygiene and healthful living. Of course, if the teacher stresses the mere factual information alone, all of these great opportunities are lost. If, on the other hand, he is alert to capitalize every bit of material to make it register its effect for more hygienic and healthful activity, it becomes an active agent in the education of the child. A teacher was observed who was conducting a recitation on the typhoid fly. The students gave a careful description of its life history, telling how the eggs were laid in filth and carrying the development through all of the stages of the metamorphosis to the matured fly. They also discussed, quite completely, the morphological structure, particularly the external characteristics. Much emphasis was placed on the sticky foot pad, the hairy projections on the legs, etc. This was followed with a discussion of the habits and habitat. The class period closed without one word indicating the significance of all of these facts to life.

How easy it would have been to show that the structure of the legs and feet was perfectly adapted to carry disease germs. How simple it would have been to trace the activities of the fly from places of filth to the exposed food on the table. What a forceful lesson in health could have been driven home had this teacher used the available opportunities; but no, he was interested in the facts. He failed to accomplish one of his major purposes.

Another teacher[1] of the same subject which the writer observed drove home a forceful lesson in good citizenship. This class was in a small, village high school. The subject of the mosquito was under discussion. It so happened that the community was

[1] The plan of this project was patterned after one described by F. W. Thomas in his "Principles and Technique of Teaching," p. 316.

infested with this type of pest so that its study had opportune significance. After carefully investigating all of the characteristics, habits, and life history of the mosquito, the teacher casually suggested a campaign against it as a project. The class immediately became interested and war on the pest was forthwith declared.

They organized into small groups, each having a definite part to play and responsibility to be assumed. The plans were carefully laid and a program was drawn up which was submitted to the village authorities in an effort to enlist their cooperation. The authorities immediately saw the value of the project and ordered all supplies which were needed. As a result of the efforts of this class, men were employed by the village to drain many of the swampy districts, breeding places for the mosquitoes. These men, working in conjunction with the students, practically rid this community of the pest.

These students performed a great civic duty and had a real monument for their work. They were taught a valuable lesson in real citizenship, that of doing a service to their fellow citizens. They had their first taste of successful community participation; they made their village a more comfortable place in which to live. They were better citizens because of this activity brought about through the study of biology.

If the biology teacher is skillful enough, he can so develop the observation of students that an appreciation of nature and its beauties will inevitably result. It is a recognized fact that the observation of the average person is very limited and, because of this, he misses many of the beauties of nature. Thus this subject can be made to function in the development of appreciation of natural beauty. There are others of the aims which can be brought out by the use of biology which have not been mentioned. The teacher must keep his objectives clearly in mind and make his course function in whatever ways offer themselves.

Problems and Exercises

1. Discuss the possibility of using the social objectives of education as a guiding philosophy in a school system where state examinations furnish the basis for promotion.

2. In what ways may the teacher capitalize on the social contacts which the students have in order to coordinate them with his program of socialization?

3. Explain the value of clearly defined educational objectives to the teacher's preparation of lessons.

4. On the basis of the social objectives of education, defend the presence in the curriculum of the courses of study you are to teach.

5. Show how the problems of childhood and those of adulthood differ in degree rather than in kind. Of what significance is this to the public school?

6. What functions do the facts of subject matter perform? Illustrate.

7. In what respect may the aims of education be universally applied?

8. What reasons would you give for the persistence of the emphasis on factual reproduction in the classroom?

9. Show how some form of extra-curricular activity may be made to function in the process of socialization.

10. Discuss how moral education as such is made unnecessary through the proper use of social objectives in education.

References for Further Study

Bagley, W. C., "The Educative Process," pp. 55–65, The Macmillan Company, 1922.

Bode, Boyd H., "Modern Educational Theories," Chap. VI, The Macmillan Company, 1927.

Colvin, S. S., "An Introduction to High School Teaching," Chap. I, The Macmillan Company, 1920.

Department of Superintendence, The, "Sixth Year Book," Chap. II.

Dewey, John, "Democracy and Education," Chaps. I, II, VII, VIII, IX, XIII, XXIII, The Macmillan Company.

Dewey, John, "Schools of To-morrow," Chaps. IV, VII, XI, E. P. Dutton & Company, 1920.

Horn, John L., "The American Public School," Chap. XII, The Century Company, 1926.

Hosic, James F., "Educational Objectives Once More," *Teachers College Record*, Vol. 29, No. 8, p. 688, May, 1928.

Kilpatrick, W. H., "Source Book in the Philosophy of Education," Chap. V, The Macmillan Company, 1923.

"List of References on Education for Citizenship," U. S. Bur. Education *Library Leaflet* 30, p. 16, Washington, 1925.

Mirick, George A., "Progressive Education," Chaps. III, IX, XI, Houghton, Mifflin Company, 1923.

Monroe, Walter S., "Directing Learning in the High School," Chap. III, Doubleday, Page & Company, 1927.

Munro, James P., "The Human Factor in Education, pp. 80–104, The Macmillan Company, 1921.

Snedden, David, "New Aims of Education," *Teachers College Record*, Vol. 29, No. 5, p. 397, February, 1928.

SNEDDEN, DAVID, "Sociological Determination of Objectives in Education," J. B. Lippincott Company, 1921.

THOMAS, F. W., "Principles and Technique of Teaching," Chap. II, Houghton, Mifflin Company, 1927.

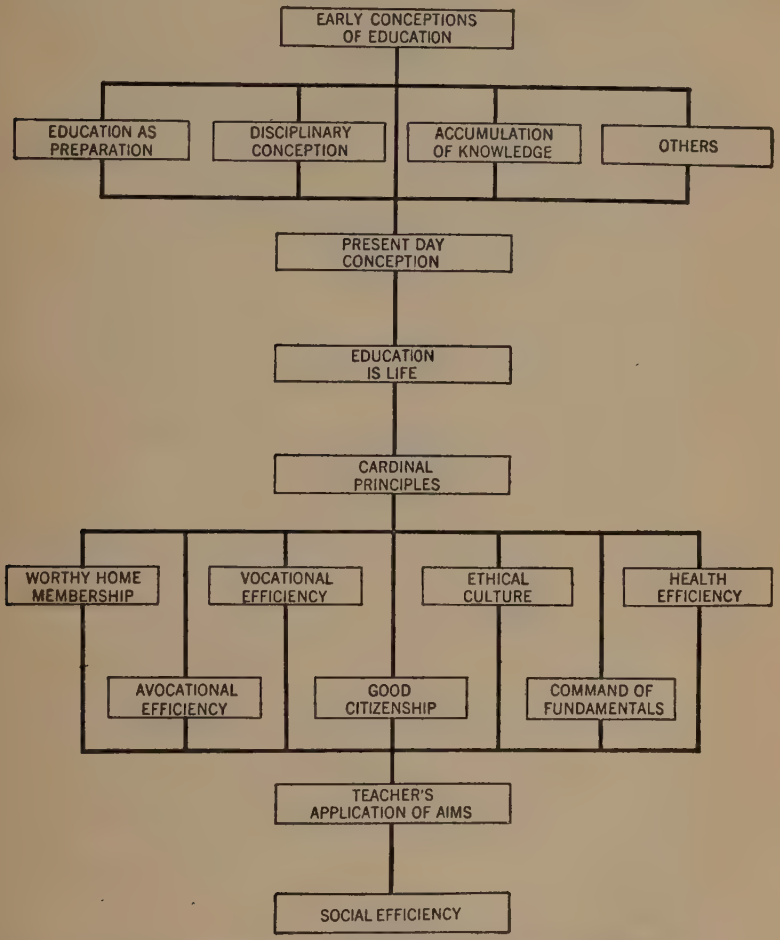

Fig. 2.—Graphical representation of the content of the chapter, The Essential Social Objectives.

Chapter III

MECHANISMS AND PROCESSES OF LEARNING

I. MODERN CONCEPT OF LEARNING

There are some very definite, basic principles of learning, and our knowledge of these constitutes the most important content of educational psychology. These fundamental principles have been discussed by many writers, yet too often their importance, and that of the mechanisms upon which they depend, is not sufficiently appreciated by those engaged in teaching.

1. Physiological Mechanisms Essential to Learning.—The physiological mechanisms essential to learning are as follows: (*a*) Sense end-organs, of which there are five kinds, *viz.*, eyes, ears, taste buds, end-organs of smell, and end-organs of touch. (*b*) Nerves or neurones to act as conduits to carry nerve impulses from place to place. (*c*) Muscles as final receivers and users of the currents carried.

The end-organs are probably little more than generators of electricity, or at least of nerve currents, the complexity of each kind of end-organ depending upon the delicacy of the force which it is designed to receive and transform into nerve current. The eye, for instance, must receive the force of light which strikes the retina and is transformed into current. Obviously, this will require a more delicate mechanism than will be required to receive and so transform the rougher pressure stimuli which result in sensations of touch.

Evidence is multiplying that the end-organs are, in actual fact, power plants hooked up to the nerves which carry the currents generated by these power plants to points where the energy is to be used, just as wires carry the currents of electricity generated by machinery to distant points.

Dr. Whitney, director of the research work for the General Electric Company, has recently made two contributions to our knowledge of nerve energy. He found in the first place that by passing a current of electricity through a number of capacities, the speed of the current slows down until it travels no more rapidly than do our nerve impulses. By placing electric bulbs in connection with the wire carrying these slow currents, a very distinct interval occurs between the illumination of any bulb and that of the one next on the wire. This experiment effectively refutes the argument, so long advanced by some, that nerve energy cannot be electrical current, since it travels at a slower rate than electricity does.

His second contribution was to verify the fact that if the eye of a frog be removed so as to retain a bit of the optic nerve uninjured, and a galvanometer, an instrument used to detect mild currents of electricity, be attached to the optic nerve, and then a bright candle placed before the eye, the instrument will show a current of electricity flowing from the eye through the nerve.

These facts very probably mean that the eye is a generator which takes the force out of light and transforms it into electric current, just as a mechanical generator takes the force of water pressure from a turbine and transforms it into electricity. The other end-organs serve similar purposes for receiving different forces as stimuli.

2. **The Body's Use of Electric Current.**—By this time the reader is no doubt wondering why so much time has been spent on these electrical theories. A very few words will serve to clear this up. Competent students know that if a muscle is sprayed with electric current, that muscle will react. This then is the final use to which the current generated as described above is to be put. It becomes the actual local stimulus to the muscle cells causing them to contract and expand and thereby perform their intended functions.

3. **The Switchboard.**—It now becomes obvious that there must be a switchboard, else the current generated would always

go to exactly the same muscles and we should invariably make the same reaction to any and all stimuli coming through any given sense end-organ. But is this not also true of a mechanical power plant and its wiring system? A switchboard is an absolute necessity in both cases.

For the human body, the brain and the spinal cord are the principal switchboards. The nerves which lead from the end-organs into these switching areas do not pass unbroken on through them to the muscles. Instead, each afferent nerve ends, either in the cord or in the brain, in a flared-out condition much like the roots of a plant. This end of the nerve, or neurone, is called an end-brush.

Since these neurones leading in from the sense end-organs thus terminate, it is perfectly clear that if any of the nerve current which comes in to the switchboard is ever to reach muscles there must be neurones capable of picking up the current and carrying it out to them. Those that do this are called the efferent nerves. The beginning ends of these efferent nerves are called dendrites. The dendrites, too, are flared out even to a greater extent than the end-brushes. If we compare the end-brush to the roots of a plant, the dendrite would, by the same comparison, resemble the branches of the plant.

The microscope shows these end-brushes and dendrites in immense numbers, and, to the untrained eye, they resemble a hopeless tangle of tiny fibres. Nevertheless, in all this seeming chaos there is the acme of order and organization. The end-brushes from each end-organ are all located in that position where they can most conveniently discharge their impulses into the dendrites of those neurones leading to the muscles which are to make the final use of the current in question.

4. **The Synapse.**—The synapse is the junction of the end-brush and the dendrite. If the reader will imagine a plant which has been pulled up and held in such a position that its roots are slightly mingled with the branches of another plant of the same kind, he will have a fairly good idea of the form of a well-developed synaptic connection. Or a still better illustration may be had by connecting up a couple of small batteries with

ordinary coiled insulated wire. Cut one of these wires and fray out the end wires of the coil on both sides of the cut. By fraying one end a little more than the other, the first may represent the end-brush while the second will be the dendrite. Now bring the frayed ends together. The moment any two of these fiber wires approach each other closely, there will be a spark, and the current will begin to flow from the stronger battery into the weaker. If the current were strong enough, and yet not so strong as to burn the wire, it might fuse these ends together, thus making a better conductor.

Something of this sort happens in our synaptic connections of the brain. When a nerve current is sent through from a given end-brush to a given dendrite the intervening matter is made into a better conductor. It may be that the current in passing from the end-brush to the dendrite lines up the molecules in the blood so as to make a better conductor. A magnet will line up iron filings so that the lines of force pass through them as a metallic circuit. In like manner, the current passing from end-brush to dendrite may line up the conducting molecules held in solution by the blood. Furthermore, the fact that the blood would begin to reabsorb or rearrange the molecules would be a perfectly logical way to account for the curve of forgetting.

5. **Reflexes, Instincts, and Capacities.**—The above described tangled ends of neurones, the end-brushes, and the dendrites have varying degrees of intimacy. Some are so closely related that a given stimulus brought in over a certain neurone to a specific end-brush will always go across to the same dendrite. An example of this is the so-called knee-jerk reaction. When the knee is struck a certain kicking reaction results which is called a reflex reaction. The synapse is so closely connected up and relatively so simple that the current goes without fail to the muscles of the leg which cause it to jerk.

But when the synapse is not so closely connected up and not so simple, yet enough so that the general character of the automatic reactions will always be the same, then these more complex and slightly more variable reactions which result are called instinctive reactions.

Primitive man had comparatively few necessary reactions to make, and some of those which he did have he performed so often, and for so many ages in the same identical way, that the synaptic connections became intimate and reflexes developed. Those connections a little less used and a trifle more varied became, by the same long use, instincts.

But there are literally millions of potential synaptic connections which are so much less intimate than either reflexes or instincts that there would never be a discharge of nerve current through them were it not for the change which is effected in them by the processes of learning. These weak connections, then, which function only when trained to do so, are generally called capacities. In these "capacity" synaptic connections is the great hope of education, for, because they exist, it will be possible for the human race to go on indefinitely learning new and better reactions, or new and better ways of behaving.

6. **Changes Which Take Place in the Synapses.**—To show the changes which take place in the synaptic connections, it may not be amiss to use an analogy. On the coils used as part of the ignition system of some automobiles are what are called points. These points are circular ends of a small cylinder-like metal about a fourth or a third of an inch in diameter and are placed end to end at about the distance of the thickness of a dime. These points serve to make and break the current as required for the proper functioning of the car's ignition system. The current in passing through these points soon "pits" them. That is, it builds up little blisters on the coil points which touch each other and thus make the breaking of the current impossible.

In a similar way, when the nerve discharge passes through a synaptic connection over a certain route, it, too, begins to cause a greater intimacy between the end-brush and the dendrite. Most probably it realigns the intervening cells of protoplasm or some element thereof, in such a way as to make of these cells a pathway or better conductor. When this connection, or bond, is so strong that a given stimulus is almost sure to cross it and result in a certain definite reaction, the person in question is said to have

learned that reaction, regardless of its value, or its influence for good or evil.

Now, bearing in mind that learning takes place only when the degree of intimacy between the end-brushes and the dendrites is increased, and that forgetting requires this intimacy to be decreased, we may proceed to the discussion of how this intimacy is increased and how decreased.

7. **The Automatic Character of the Neural System.**—Let the fact now be noted that at no time while life lasts, asleep or awake, are all of these end-organs inactive. The human body cannot, in any way or at any time, escape all stimuli, for we are literally burdened with them. The open eye cannot prevent light images from falling upon the retina and thereby producing a sensation or nerve current. Even a closed eye can be stimulated by pressure. Under natural conditions, absence of light alone can suspend the generation of nerve current by the eye. Likewise, absence of all stimuli for the reception of which any one of the other end-organs is specialized is the only way to suspend the generation of current by that organ. But since it is impossible to absent all stimuli, it is seen that the nervous system, at least in part, does not at any time cease to function.

To be more specific, let it be remembered that even when a man is in bed asleep, the weight of his body is continually stimulating some of the end-organs of touch. The foreign materials throughout the intestinal tract, both that which was taken as food and that which has been poured into the duct as secretions, give pressure and chemical stimuli. For example, the acids, ever present in the intestinal tract, have a continual stimulus effect. These things being true, it is obvious that the nervous system is constantly functioning in an automatic way.

8. **Native Drives.**—The nerve currents produced by this automatic functioning are known as the native drives. Especially is this true when the force of the stimulus is intense enough to give a very pronounced impulse, or urge toward action. By this is meant that stimuli differ in degree of intensity and hence the amount of current which they will cause the end-organ to

produce differs in degree. One candle may hardly be expected to cause the nervous system to vibrate with energy as ten thousand might. A domestic cat does not create the drive in observers that would be generated by a wild tiger at large. To sum up this idea, given a stimulus playing upon a sense end-organ, a nerve current is absolutely unavoidable, and if the stimulus is intense, the current produced must go somewhere. When the afferent nerve becomes surcharged the current can do nothing else but jump from the brush to the dendrite and be carried down an efferent nerve. Now since these go only to muscles, it is evident that the charge will be delivered to the muscles, where, because of the divergent nature of the muscle-end of the efferent nerves, the current will spray the muscle cells with electricity and result in muscular activity.

9. **The Grafting of New Reactions upon Native Drives.**— Man has never yet been known to create original force. He cannot do it in learning. But man's progress is largely the history of his successful harnessing of natural forces. Not the least of these successes is the harnessing of force within his own body, these nerve currents, which he has done, partially at least. By harnessing, in this case, we mean our understanding of the cause and effect of the energy which flows through our nerves, and of how it can be switched in the brain so that instead of discharging from the end-brush into what might be the most accessible dendrite, it will be discharged into some other dendrite and made to cause very different muscles to function than would otherwise have been the case.

To illustrate this point, suppose a small child sees a cat for the first time. Unless the natural effects are neutralized in some way, say, by the child's being close to an older person in whom he has learned to have implicit faith, the child may be somewhat frightened. This energy is taken to the brain and discharged into the nerves which cause the child to scream, wave his arms, and perhaps prance around in considerable agitation. Nor are these blind, natural reactions. A child in such a state of activity appears to the cat as a very much more formidable object than would a placid child; and, what is true of the cat would be true of

more dangerous animals. In addition to the direct effect upon the cat, what reaction could be designed to bring aid more quickly to the child? Indeed, this is an example of nature's own way of developing native reactions because they are useful.

Under the circumstances above described some older person will hasten to the child, but seeing only a harmless cat will reassure the child, by saying: "Honey, it's only a cat. It won't hurt you," etc. At first the child will pay but small heed to these new stimuli. But after more experience, he will be content merely to watch the cat. But let the cat make any sudden moves that seem to threaten the child, the cries and quivers are quickly reproduced. Later, the adult will say: "Baby, say cat." And sooner or later the child will try to say "cat." But what the child says is not very likely to be "cat" but any one of a thousand sounds, some resembling and some in no way resembling the word cat.

What is going on in the nervous system of this child? Just this: Nerve energy is generated by the child's eyes as a result of the cat-stimulus. This energy at first flowed to the most accessible dendrites and then to muscles which react in the above described manner. Then the child makes an attempt to switch these currents to the dendrites which lead to the muscles of the vocal organs and activates them so as to get just the right reactions necessary to say "cat." This is no small task, as anyone who has taught a very small child to say a new word will realize.

The currents of energy are very difficult to control because of the great complexity of the commingling of end-brushes and dendrites. It is very easy to find the current being discharged into the wrong dendrites. But persistence will finally be rewarded so that sooner or later the sight of a cat will no longer produce the reactions crying and shaking, but the vocal reaction necessary to say "cat." Technically, this change is known as associative shifting.

What has happened is that a new synaptic connection has been put to use in the brain of the child. The current has been switched from its old native route of primitive usefulness to a new one better suited to the domesticated life of a civilized child.

He has learned a new and certainly a better way of behaving when he finds this particular kind of nerve force being generated by his eyes. He has discarded old reactions and utilized the drive to effect new ones. This redirecting of our native nerve energy from old reactions to new ones is *education.* In a sense it is like grafting a bud on a tree. And so far as the neurone changes are concerned, this discussion of the changes that occur in learning to say cat are general for all learning. Of course, the same end-brushes and dendrites will not be affected, but the cause, effect, and manner of the changes that occur are brought about by the processes before mentioned, for this is the way of all learning.

II. LEARNING FOLLOWS NATURAL LAWS

Law is the name applied to that predictable action which follows without exception in all cases where all the elements of the situation which once caused the action are again set in exactly the same relationships. We know that when hydrogen and oxygen are mixed in the proper amounts under certain specific conditions, water is formed. This has always been true and will continue to be so forever, for these two gases combine in accordance with an immutable law. As long as the force of gravity has existed, all objects when dropped from mid-air have fallen to earth. So long as the controlling conditions remain constant the resulting actions are invariable. It has always been so and will so continue.

Thus, if we are to think of learning in the light of law, we must realize that when a situation in its entirety which has been called *S* leads to a given reaction which has been called *R*, if we duplicate, reset, or restore the situation in absolutely every detail unmodified by anything learned in any former reaction and unchanged in any way whatsoever, then one can predict with absolute certainty that the same reaction, *R*, will follow, for this is the unchanging principle of all law.

III. THORNDIKE'S LAWS OF LEARNING

The laws of learning as announced by Thorndike are statements of principles as immutable as any other laws of nature, for they

are laws of nature—the original nature of man. They are based, as of necessity, upon the fundamental facts of all law that exactly similar *S*'s lead invariably to exactly similar *R*'s.

In Chap. I we have implied that Thorndike did not make the laws of learning, he merely stated them in intelligible language. He did not really discover them, for they were crudely known ages before the birth of this great educator. Franklin did not discover electricity, but he placed it in its proper category and opened the road to the extensive use to which it has been put since his day. Likewise, Thorndike clarified the laws of learning so that we may go on deliberately and scientifically to use them in our learning processes. It must be remembered, also, that they are laws of learning and not laws of teaching. The laws of learning follow.[1]

1. **"The Law of Readiness.**—When any conduction unit," (meaning any part or the whole of the nervous system acting as a complex) "is in readiness to conduct, for it to do so is satisfying. When any conduction unit is not in readiness to conduct, for it to conduct is annoying. When any conduction unit is in readiness to conduct, for it *not* to do so is annoying. By a satisfying state of affairs is meant one which the animal does nothing to avoid, often doing things which maintain or renew it. By an annoying state of affairs is meant one which the animal does nothing to preserve, often doing things which put an end to it."

2. **"The Law of Exercise.**—When a modifiable connection is made between a situation and a response, that connection's strength is, other things being equal, increased. By the strength of a connection is meant roughly the probability that the connection will be made when the situation recurs." Vigor, duration, and recency will be potent elements. The above may be called the 'law of use,' while the negative form of the law of exercise may be called the 'law of disuse,' it being the converse of the law of use."

[1] THORNDIKE, E. L., "Educational Psychology," Vol. II, p. 1. Quoted by permission of the Bureau of Publications, Teachers College, Columbia University.

3. **"The Law of Effect.**—When a modifiable connection between a situation and a response is made and is accompanied or followed by a satisfying state of affairs, that connection's strength is increased; when made and accompanied or followed by an annoying state of affairs, its strength is decreased."

4. **The Five Subsidiary Laws.**—In addition to the three major laws of learning, readiness, exercise, and effect, Thorndike lists five other principles under the title of subsidiary laws. They are multiple response, mind set or attitude, partial activity, assimilation or analogy, and associative shifting. It must be remembered that they are not principles of process, but merely conditions which modify or in some manner control the methods or directions in which the actual learning processes function. Perhaps it would be better to speak of them as variables which affect the setting, the action, or the results of the three major laws of learning. The part that these principles play in learning may be briefly told by taking them separately.

a. Multiple Response.—This is the name given to the universal principle that a learner who is in a state of readiness to accomplish a certain end will make reactions toward that end, but if the responses just tried fail and thereby end in annoyance, he will try another, and so on until he hits upon one which is successful or else tires of such efforts. In other words, readiness insures exercise of one or more reactions.

b. Mind Set or Attitude.—This indicates the kind or the quality of readiness to act. It might almost be said that it means readiness to act to a definite end in a definite manner. One saying the *abc*'s has set the mind to that end or to a definite series of reactions, so that when he reaches *c* he goes on to *d*, but if the mind has been set to spell "cat," the letter *d* will probably never occur to him as a sequent to *c*.

c. Partial Activity.—This is the term applied to the fact that we react to but a small part of our total situation at any one time. If we call everything that might possibly stimulate any one of our sense organs at any one moment the "total situation" for that paticular moment, it becomes obvious that we do not react to it all at once. Instead, we select the stimulus that is strongest

for the time being and react to it as long as it continues in the ascendency. Probably the law of diminishing returns is the principle which determines the relative strength of the several elements which compose our total situation.

d. Assimilation or Analogy.—This is practically the same thing as Herbart's doctrine of apperception. That is, we learn new things in terms of things already known. If the old and the new are practically identical, they will fuse into one and transfer completely; if they are analogous, they will combine easily. But should the ideas be disparate, then the one would repel the other.

e. Associative Shifting.—This is the term which Thorndike uses for the fact that if two stimuli leading to different responses are associated in time, place, or other manner, and exercised sufficiently, eventually one of the stimuli will acquire the power to call out the response not originally connected with it. This principle is at the base of much of our so-called behaviorism, conditioned reflexes, and other names for automatic habits.

These then, are the laws or principles which underlie all teaching and which, therefore, must be adhered to in teaching any specific reaction or any subject. But, you may say, many an excellent and successful teacher never heard of these laws. This is true, indeed, but it is also true that Julius Caesar in crossing the Rubicon and the Rhine obeyed the law of gravity long before it was stated. Likewise, the above mentioned successful teachers followed the laws of learning even though they had never been stated. Success follows the laws whether they are used wittingly or unwittingly, and it just as surely departs when we transcend the law.

Furthermore, it cannot be said, unconditionally, that these excellent teachers were ignorant of the laws of learning. For, as already said, Thorndike did not create these laws. A loose understanding of them antedates him. To set this fact at rest let us examine the early practices of teaching.

If the pioneers of teaching believed anything, they certainly believed that one will succeed at learning, as in any other kind of work, when his whole heart and soul are in the task. Thus, success follows most rapidly where interest points the way. What is interest? It may or may not be identical with readiness, but no

one will ever be able to show any relationship between the two other than a very high positive correlation existing between the degree or amount of each when measured over a range of any given acts. Or, in other words, as the amount of interest rises and falls, so rises and falls the degree of readiness.

It is true that in the past many thought that this interest, or, as we shall call it, readiness, could be forced to a much greater degree than we now believe possible and likewise many, if not all, placed too little emphasis upon it, yet they were using the principle in part, at least, even though inadequately and inefficiently.

These stalwart teachers of old also believed that "practice makes perfect," neglecting, of course, in part if not altogether, the fact that practicing an error makes an error perfect, or that no amount of practice is likely to make us perfect in the art of sitting on a tack. We know, too, that if one makes an awkward movement and repeats that movement over and over it becomes fixed and a part of him. Likewise, if one misspell the word "believe," getting the *e* before the *i*, the more the practice the more perfect and lasting becomes the error. And, yet, common sense dictates that the old adage "practice makes perfect" presupposes that the shortcomings are to be noted, corrected, and overcome. It does not follow that the past teaching met the problems of how these corrections were to be made efficiently or even at all. It is likely that herein was the greatest failure, for they did not know what biological changes take place in the synaptic joints of our nervous system whenever we learn a new way of reacting. They certainly would not have believed that all the change there is is in these synaptic connections, and that there is no other way of learning than that of exercising these connections by sending nerve discharges through them, which of necessity eliminates all possibility of storing or "canning" learning in either a conscious or unconscious mind by some mysterious power of meditation, absorption, or other concocted substitution for the truth, *viz.*, that we learn the reactions which we make and nothing else.

But we are unable to make a very successful brief when we attempt to justify the wisdom of our predecessors in the use or the misuse of the law of effect. It seems that this was the most

"undiscovered" law of the three and, yet, paradoxical as it sounds, it is probably the most potent of the three major laws. It is not meant that it is more fundamental, for in this case, at least, we decline to compare fundamental, but we take it at its *prima facie* value. These laws are all basic and necessary intrinsic parts of the learning process. Yet the law of effect operates either to fix or totally destroy the effects of the other two. Concrete illustrations will be given of this later on, so that we may pass the above dogmatic statement for the time being.

The point here is that there is no adage, no evidence, unless it be "nothing succeeds like success," which leads us to believe that the law of effect was knowingly used prior to Thorndike's earliest writings; or, at any rate it is not so well fixed that the mind of man "runneth not to the contrary."

The psychology of learning, then, may be summed up as the functioning of the nervous system whereby, in accord with the laws of learning, changes in behavior are brought about. The principal physiological change is in the synaptic connections. Little or no change other than biological growth occurs in the muscles.

The method whereby the changes are brought about is best stated as the laws of learning, namely, readiness, exercise, and effect. Readiness is both physical and mental. Exercise is practicing the desired reaction. Effect is the amount of satisfaction which results and determines future effort and the permanence of results already registered.

The five subsidiary laws are in reality merely variables in the operation of the laws of readiness, exercise, and effect. They are not methods of learning but merely factors which modify the laws of learning. They may determine what we will learn, how rapidly we will learn it, with what economy, or in terms of what we will learn it, but even so, they are but variables which may affect the three laws.

Problems and Exercises

1. A student was observed who gave intermittent attention to his school work during study. Each unusual noise attracted him. If the teacher changed her

position in class he followed her movements. Explain this condition psychologically and suggest ways to overcome this lack of ability to concentrate.

2. James, fifteen years old, stated that he "hated" second-year English. He was greatly interested in aviation and was well read in this field. How may his English teacher capitalize this interest to make her subject attractive to him? In terms of the laws of learning what must she do to stimulate this enthusiasm?

3. What important changes have come about recently in the popular attitude toward psychology?

4. A school principal recommended to his teachers that they take roll call and fill out necessary daily reports during their daily written practice periods in arithmetic. Under this plan such practice was unsupervised. What difficulties would you suggest might follow such a plan? Explain.

5. Show why the nerve current never crosses the synaptic connections from the dendrite to the end-brush.

6. A teacher of algebra states that her students would master a process during the period of drill but that soon after "new work" was taken up they would quickly forget what they had at one time reduced to automatic control. What is the cause for this and what remedies would you suggest?

7. Illustrate the principle of associative shifting in terms of a child learning to say "walnut."

8. A teacher of history who was having difficulty in getting her students to study assigned her lessons by use of the "page assignment" only. Explain psychologically the cause or causes of her difficulty.

9. Of what value is it to discover the laws of learning? Would the same be true if they were not part of our original nature?

10. Give the arguments pro and con for the idea set forth in this chapter to the effect that the five subsidiary laws are in reality merely principles of variability of the three laws, readiness, exercise, and effect.

References for Further Study

Colvin, S. S., "The Learning Process," Chap. II, The Macmillan Company, 1920.

Gates, Arthur L., "Psychology for Students of Education," Chaps. II, III, IV, X, XI, The Macmillan Company, 1924.

Pillsbury, W. B., "Essentials of Psychology," Chap. II, The Macmillan Company, 1918.

Skinner, C. E., I. M. Gast, and H. C. Skinner, "Readings in Educational Psychology," Chap. VI, D. Appleton & Company, 1926.

Swift, E. J., "Mind in the Making," Chap. VI, Charles Scribner's Sons, 1908.

Thayer, V. T., "The Passing of the Recitation," Chaps. VI, VII, VIII, D. C. Heath & Company, 1928.

Thorndike, E. L., "Educational Psychology," Vol. II, Bur. Publications, Teachers College, Columbia University, 1913.

Whitney, W. R., "General Electric Review," Vol. XXVII, No. 7, July 1924, p. 437.

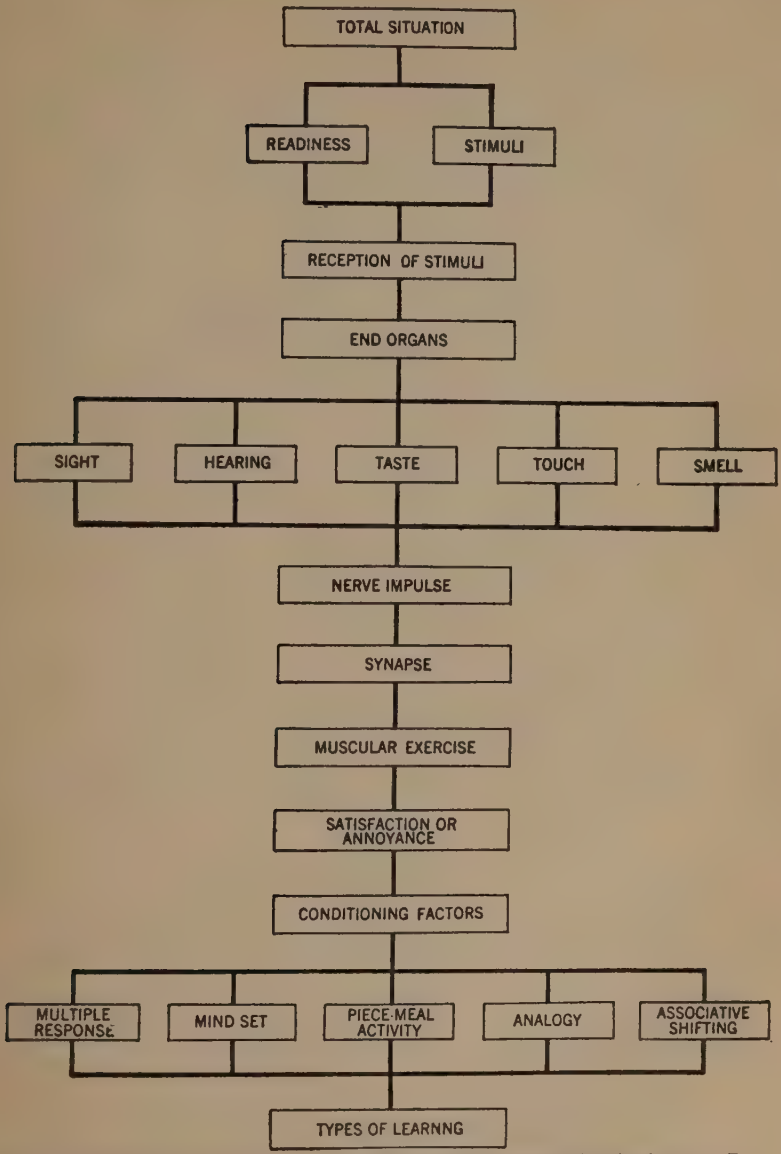

Fig. 3.—Graphical representation of the content of the chapter, Mechanisms and Processes of Learning.

Chapter IV

PURPOSES OF SUBJECT MATTER

I. WHAT WE LEARN

As was said in Chap. II, what to teach is today still the great unsolved problem of education. A study of the excerpts quoted in Chap. XIX of Dr. Kilpatrick's "Source Book in the Philosophy of Education" is very instructive in dealing with the problem of curriculum or subject matter. The quotations referred to are the cream of past and present thought on subject matter and problems correlated with it. These opinions have been clipped by the author and assembled in one chapter, and they represent the findings of many years of reading and research.

No doubt the statement will go unchallenged that the most important inference to be drawn from a careful study of these extracts is that no very helpful definition, discussion of, or contribution concerning subject matter, or anything pertaining thereto, was discovered by the author of the "Source Book." Indeed, as one quotation after another is read, the feeling comes to the reader that an understanding of subject matter will become less of a possibility in inverse ratio to the amount of reading thereon.

Nevertheless, it does not appear to the writers that the problem of subject matter is so difficult when conceived of in a general way and from some well-defined points of departure or relationships. Might not the first question be, *what do we learn?* If so, we may borrow the answer from psychology, for it has quite definitely shown that we learn *reactions* and nothing else. By this is meant that absolutely every change brought about in us by any sort of learning is ultimately a reaction. To appreciate this fact, the reader must realize that when he learns to write, to use a jack plane, a buzz saw, a chopstick, a toothbrush, or any mechanical instrument, what he has done is to learn one or more

reactions. It is just as true that when a child learns to say "cat," he has learned reactions—reactions of the vocal organs.

Dr. Pintner often says in effect that no reading can be done so "silently" that there will be no "inner speech." By this he means that no thought can be conveyed by the printed page unless the reader uses his vocal organs to "say" the sentences, even though it be granted that the muscular reactions of the vocal organs are ever so light. If Dr. Pintner is right, and we believe he is, then no one can "commit to memory" or even think without muscular reaction. Of course the amount of muscular reaction will vary with people and with the amount of practice in curtailing the reactions which each has had. In reading, for example, it will vary from a very audible whisper accompanied with much lip and tongue movement all the way to the slightest quiver of the muscles of the organs of speech. But the most rapid of silent readers will not be able to free himself of this faint quiver, for it is the direct result of the nerve currents. It may be thought of as the natural and automatic impulse to action. In more technical terms, perhaps it is the muscle acting as a shock absorber for the current that must cross the synapses.

When thought of in this way, it will be seen that silent reading or silent thinking is nothing more than reducing the nerve current to the minimum amount needed, and consequently when this very small amount of current crosses the synaptic connections and flows down the nerve to the muscles, there is merely enough of the current to cause a slight stir of the muscular cells.

II. HOW, WHY, AND WHEN WE LEARN REACTIONS

Assuming, then, that the psychologists are right when they say that we learn nothing except reactions, would not the following three questions be of primary importance? (1) How do we learn reactions? (2) Why do we learn reactions? (3) When do we learn reactions?

Again, psychology gives us the answer to the question, "How do we learn reaction?" All reactions which we ever learn are somehow learned through the operation of the laws of learning. It will be remembered that those laws are readiness, exercise, and

effect. It is obvious then, that we learn a reaction only by making that reaction. Whether or not we shall ever make the reaction at all will depend to some extent upon the law of readiness; and whether or not we shall continue to make or repeat the given reaction after it has once been made will depend very largely upon the law of effect; but whether or not we shall ever acquire the skill to make effectively any learned reaction whatsoever depends absolutely upon the law of exercise, for "we learn to do by doing" and in no other way.

It is now seen that since we learn only reactions and these by exercise, or by making the required reaction, certainly subject matter does not cause the reaction, for the cause of the reaction is the flow of the nerve current over certain neurone routes and the consequent muscular activity. The operation of the laws of learning, then, and not subject matter, is the *cause* of learning any reaction.

As to the second question, "Why do we learn reactions?" the answer is that we learn them as a contingency of a "felt need." The felt need may be of purely subjective origin, emanating entirely from within, or it may be the resultant of one or more of the natural social forces mentioned in Chap. VII. That is to say, society somehow brings one or more of these social forces or controls to play upon the learner and thereby creates in him the felt need which acts as a drive to make the learner practice the reaction or reactions in question. All of this very obviously entails a cause, social or personal, for the felt need ever being in existence, or at least ever being recognized as existing. That which causes the learner to recognize the felt need is subject matter.

We learn reactions whenever something occasions the making of those reactions. The key of a typewriter or that of a piano could never actually cause or "build" a synaptic bond but it may occasion the building of it. In this conception of the nature and function of subject matter, the word "occasion" is very significant. It especially conveys the timing element. It indicates a certain opportuneness of the stimulus effect.

To be more specific, suppose a child, unacquainted with the common lead pencil, is shown one. The light rays come from

the pencil to his eyes and affect these nerve current generators in the ways described in Chap. III. The current produced is carried to the brain and there switched about from the courses that it would take, by nature, to the muscles of the vocal organs. This switching is the process which has already been described as "associative shifting." Someone has given the child the name "pencil," while he has been engaged in "sensing" the pencil. Later, when he sees the pencil, the current is quickly conducted to the organs of speech so that the result is that the child says "pencil."

Now, just what has the object "pencil" done in all this process? It has been responsible for certain light rays which have fallen upon the retina from which certain nerve impulses are generated. But the handling of these currents is changed from an automatic conduction of old racial, or instinctive, reaction muscles to new or learned reactions.

Thus, subject matter is some sort of stimulus or series of stimuli. It causes or, more properly, occasions activity of one or more sense organs. The sense organ changes the force of the stimulus into a new energy, *i.e.*, nerve current, which is controlled and made to function in new ways by the educative process, the methods of doing which are the laws of learning. It may be said that subject matter makes some sort of learning imperative, and this is true even though the learner is merely learning to ignore the given stimulus. But it is the functioning of the laws of learning which determine what shall be learned and how well it shall be learned.

We are not unmindful of the fact that in the discussion, so far, material subject matter has been used for illustration. But what has been said is equally true of abstract subject matter. For example, consider the idea of *spirit*. Instead of a picture or an object we may use a word picture. Certain descriptive words are used which set to work the imagination of the learner so that he constructs some sort of semblance to an actual concrete stimulus. The nerve currents operate in exactly the same way as if the stimulus were material. Naturally, the strength of such a stimulus will depend upon how well the imagination has been made to function.

It will not be amiss to say that the term "imagination" is used to mean image making from material recalled from past sense functioning. The patterns of the complete image may be new but the component elements are old conceptions.

III. TYPES OF REACTIONS TO BE LEARNED

Having answered the three questions set on a preceding page, let us now ask: "What reactions should we learn?" The answer to this question is found in almost any one of the flood of new educational books. "Learn the useful," is heard on every hand. But the fact that so much is useful further limits this to: "Learn the relatively useful." This in turn merely makes it a personal matter, since what may be most useful to one, or in fact absolutely indispensable, may be of little or no use whatever to another. The fact that the learner has physical, mental, and spiritual needs, however, must never be lost from view by the director of learning.

After all, why do we or why should we learn anything? Is it not to acquire new and better ways of behaving? Behavior is a very broad term, but in all its breadth, it can always be traced to some semblance of muscular reaction. Should we learn reactions which pertain to reality or should we learn a mass of reactions which have their beginning and their end in hallucinations? It would be a wonderful treat to those who read for amusement if some one who lacked the mental capacity for algebra, yet was compelled to take it, could set down the real results of such learning. Can the reader imagine what such a one's philosophy of algebra would be like? To him the original purpose, the function, the possibilities, the processes, the artificial terminology, and other proclivities of algebra must be not unlike the tangled wrecks in the wake of a cyclone!

Somehow or other, relative utility of subject matter entails some sort of "tuning" between the difficulty of the reactions to be learned therefrom and the inherent capacity of the learner. A series of reactions which constitute a given task must challenge the learner to the point where his curiosity and his instinct of mastery will be aroused. Then, and then only, will come the

native satisfaction from the performance of the task that will insure the learning thereof. Who has not felt the absorbing thrill of working at a baffling puzzle which "looks easy"?

On the other hand, if the task presented by any given subject matter is too easy for the given intellect, such a task is likely to be treated with contempt and no proper learning will take place. Instead, a very grave disciplinary situation may develop.

On the basis of relative utility, the criteria for choosing subject matter are as follows: (1) Frequency of use. Anything that will be used very often is not to be eliminated. (2) Crucialness. Reactions of great importance, though perhaps not used very often, are essential subject matter. Learning to swim is an example. (3) Transfer value. There are many reactions that can be used in all sorts of situations. Reading is a fair example. (4) Personal appeal. The amount of personal appeal that the particular bit of learning may have for the individual learner.

1. **Primary Learning.**—It is not difficult to see that learning never takes place as a single and independent reaction. On the contrary, all learning is very complex. In varying degrees all people are learners throughout life, and the learning which we do can be classed under at least three heads. The immediate task learned may be called the primary learning. To illustrate this, suppose the reader comes upon the word "diffident" and does not know the meaning. The dictionary is consulted and the meaning of the word learned. This is the primary learning.

2. **Associate Learnings.**—But what a host of other things might be learned in doing the task. It might be found that this word is not given in certain dictionaries, and not in certain editions of others; that it must be built from roots if gotten from still others; that the paper is so thin that it is difficult to read the meaning; that the proper page is torn out of one dictionary; that the definition is as hazy as the learner's own idea of the original word, etc., etc. Such learnings are in a way no part of the real task, but they are seemingly inseparably associated with the task of learning the definition of "diffident," and are called, by some writers, "associate learnings."

3. **Attitudes.**—There are the attitudes which are built up as a result of a given task. In the case of "diffident" the learner may acquire very definite mind sets against certain dictionaries. He may make resolutions to attend more carefully to the business of acquiring a vocabulary. He may decide to make use of the well-known expedient of using another word when his own definition is doubted. Melvil Dewey worked out the Dewey Decimal System for libraries because of an adverse attitude toward library systems formerly used.

Space does not permit a full discussion of these three kinds of learning. Therefore, the authors are conscious of being arbitrary when they say here that of the three kinds of learning, the last mentioned above, *viz.*, attitudes, is very much the most important. The whole psychology of success or failure is closely tied up with our attitudes. Next in importance are the associate learnings. They have great transfer values. Least important, paradoxical as it may seem, is the primary learning. However, this does not mean that the primary learning may be dispensed with, or carelessly done, for the value of the associate and attitude learnings is highly dependent upon excellency in the performance of the primary reactions.

To illustrate further the different kinds of learning, the following true story is given: A certain boy was attending school at a time when the older boys were making and flying kites. He too, wished to own a kite, but had little confidence in his ability to make one. His older brother made the kite desired. When it met with an accident another was made, but when asked to make the third kite, the brother refused.

The boy then set about to make his own kite. At first he consulted the brother as to materials and methods. A kite was made, in fact many kites were made by the boy, but never a one would fly. To this day that boy, now a man, does not know why these kites would not fly. As he looks back over the experience he knows that the proper measurements were taken, the best of materials used, and in the later kites, no small amount of skill, developed by much kite building, was used. Yet it was all to no avail. Stubbornly the kites refused to take the air. They looked fine and they were fine so far as workmanship was con-

cerned. They would have sold well in a store for they would have caught the eye of any real boy. But their looks deceived; they would not fly.

The boy's parents, his uncle, his brothers and sister, and his young companions made light of his kite-making failures. They could not have known the hurt they gave, for they knew nothing of the law of effect. Is it not clear that their remarks were only additional annoyance added to that which already smote the boy because his kites refused to fly? What resulted was not to be unexpected. The boy developed a decided distaste for the use of tools to make anything and everything. He sought relief in learning abstract things. By the time he finished high school he thoroughly disliked all work of a mechanical nature, even the laboratory work of the school. When his father urged and promised support if he would study medicine, this hatred caused an obstinate refusal. Medicine to the boy meant tools and test tubes.

Now let us consider the types of learning. Making the kite was the primary learning. The things learned about tools, materials, etc., was one kind of attendant learning and a very important one, too. But the attitude which was developed, or learned, toward certain lines of work was very much the most important attendant learning. In fact, it was much more important than the primary learning, for kite making was a passing interest with the boy, and of little ultimate use. The knowledge of tools and materials was more valuable than the actual kite building because it carried over to many situations, but the attitudes changed the course of the whole life. In this case they represent the psychology of failure, at least, along a certain line.

Now consider what would have been the result had the kite making been successful after a fair amount of effort spent upon it. All would have been praise where, as it happened, all was taunts, and great would have been the satisfaction to the boy. The psychology of success would have taken the place of that failure, and possibly the man would now be a successful surgeon.

From this brief sketch it may be seen that the choice of subject matter is far reaching in its effects. Were it an end in itself we should need to consider only the primary learning, and while it

would often happen that no great gain would result from it, yet there could be no great harm. But it cannot be made an absolute end in itself. The attitudes are inevitable correlates of subject matter, and in these attitudes lie the potentialities of great harm or great good.

It is then of the utmost importance that subject matter be not lightly selected. It should be chosen only in the fullest possible light of its purpose and probable outcomes as a result of: the primary learnings involved; the tool and material knowledge to be gained; and the mind sets and attitudes most likely to be built up by its use as subject matter.

Since learnings occasioned by subject matter are reactions, it is appropriate to ask, "What is to be the ultimate purpose of these reactions?" Many writers have dismissed this question by saying that the purpose is to produce good citizens. But what is a good citizen? When is a person leading a good life? What do we mean when we say we wish to teach the young to do better the desirable things which they will do anyway?

The writers believe that good citizenship, or good Americanism, is the proper, economic, and efficient use of our social inheritance for the purpose of fully developing the desirable latent powers of our biological inheritance. The child at birth has a body and nervous system, and these, such as they are, constitute his biological inheritance. Either or both may be weak, mediocre, or of exceedingly great capacity for development. They may have facilities and tendencies to action along certain more or less complex lines, but, whatever they are, they constitute his sole biological inheritance.

In addition, the newborn babe is "the heir of all the ages in the foremost files of time." Or in other words, he finds not alone the works of nature in the world about him, but also the very considerable works of man. These are his social inheritance. They are the sources from which he must receive the very sustenance of life itself. They are the reservoirs from which human needs must be supplied. But the social inheritance is even more. It is that which lends itself in various forms to us so that by it and through it we can exercise and develop the latent potentialities of our biological nature.

To illustrate, suppose a child has capacity to learn music, say, to play a piano. This capacity is part of his biological inheritance, but what would become of it were there no pianos or similar instruments on which he might develop this potentiality? It is perfectly conceivable that he might live a long life and die without ever knowing that he was the possessor of this capacity. Among the early Indians of North America, there were many who might have played a piano, but not one of them did because the piano did not constitute a part of their social inheritance, as it does of ours.

Let us repeat here, and in terms of this illustration, that the piano does not form nor even cause the synaptic bonds that are set up by learning to play it. It merely occasions the forming of those bonds by lending itself as subject matter. The bonds are caused by the operation of the laws of learning whereby nerve impulses are sent through the meshwork of the central nervous system from end-brushes to dendrites and slowly change certain very poor conduction routes into very much better ones.

IV. WHAT TO TEACH

In the light of this preliminary discussion, we may reconsider the age old question, "What shall we teach?" If we go back to the very first teaching and in imagination reconstruct the scene, it most assuredly would reveal someone who could do a certain thing, doing it for another whom the informal teacher had found failing at the task. Thus, by example or illustration, was taught something that the learner considered useful to himself. In those days the elders were the teachers, because each adult had learned practically all that anyone knew. But when the race passed into a stage of even low industrial culture, a sort of specialization began so that to learn any given line of work one had to seek a master of it for instruction. This gave rise to the apprenticeship system, though not at first so called.

As times changed and apprentices were no longer assets, it became necessary to resort to a teaching class. Naturally, these teachers at first taught the useful but, as they became more and more detached from the active industry of the race, they failed to discard the obsolete and instead organized a more-or-less

static course of study. Soon much of this material, being utterly useless, had to be learned as an end in itself. To do this would obviously require associated motives. They were supplied by the pretenses that such subject matter was cultural, or that it had great transfer value and therefore "formally disciplined" the mind for the solution of any and all of life's problems.

In recent years, however, as the complexity of life has grown and the demands upon us have stiffened, there has been a decided movement to get back to the useful. The going is not easy; for those teachers who have spent their lives preparing to teach the so-called "cultural" subjects are a very powerful vested interest. They think that the trend toward utility is destined to rob them of their profession. They have effectively advanced the argument that their subjects, too, have some use and therefore a place in the curricula. This turn of the question drives us to the idea of choosing subject matter on the basis of *relative* utility. This in turn completes the cycle so that once more it is the hope of education to derive its subject matter from the immediate, recognizable needs of the learner.

By this sign obsolete and extrinsic subject matter should be eliminated. Proper organization should bring about discontinuance of teaching future values before they are needed. That is, what C. C. Peters calls "cold storage education," and Kilpatrick, "deferred values," should cease to be considered as legitimate educational practice, for the learning of such material should be postponed until a more opportune time. When this is not done, constant drill on it is required if it is to be recalled when, if ever, the time for its use comes. Such drill is largely waste as it requires the time and energy that could better have been spent in learning things of greater immediacy.

Thinking in terms of the learner and in the light of what at present is known of the learning processes, subject matter is the stimulus which plays upon the sense organs and thereby occasions the nerve currents which ultimately cause muscular reaction. These reactions in turn are used by the learner to do the things which he feels a need for doing. Also, it has been established by experimental proof that it is more economical, and productive of greater efficiency, to use the same subject matter,

to learn originally to do a certain thing, that will be used later on to occasion the functioning of the reactions learned. The same principles which make it better to use such subject matter also indicate that the organization thereof should be the same as will be encountered later.

By such practice the "felt need" will provide a state of readiness and the organization will be a real unity, thus insuring the correct order of the practice exercises, while the wholeness of the accomplishment in supplying the "felt need" will be most certain to be followed by the satisfaction necessary sufficiently to strengthen the bonds in question. Thus the learner will have acquired reactions of intrinsic value to himself.

It is a truism to say that with the acquisition of skills which will function thus in actual life situations, the possessor will find plenty of opportunity to use them. In turn this use will bring him to other problems and stimulate further learning. In very fact it becomes a constantly widening circle of intermittent learning, opportunity to use the learning, and stimulation to more learning.

While in the light of our modern knowledge it is difficult to justify much of our present curricula, such as the highly standardized organization or the commonly accepted methods of presenting it, yet it is not our present purpose to advocate its abandonment. These always will change slowly, and as a result of other changes rather than a forerunner of them. This being true, it is the part of wisdom to inquire as to what is now feasible.

It is certain that even in states where the course of study and examination requirements are most stringent, much of the extrinsic material included may be safely omitted without fear of even being held responsible for it. Likewise the organization may be improved. Then, since method is a necessary correlate of the organization, the best presentation possible is always permissible.

The fact is that many experimental schools which are using a thoroughly dynamic curriculum organization of subject matter for unity's sake, and appropriate application of the laws of learning, are doing epoch-making educational work. In such schools the teachers are real directors of learning, not task masters.

Problems and Exercises

1. Robert D. expressed great enthusiasm for the subject of electricity when studying physics but, as he stated it, he "thoroughly disliked the subject of heat." Robert was somewhat of a young expert on radio. How may this fact be an explanation of his attitudes toward these two subjects?

2. A modern teacher of history reported to a parent that although his daughter had failed to pass the "Regents Examination" in American history, it was one of the most, if not the most valuable course the girl had taken. This statement the teacher made in face of the fact that the girl knew but very few of the facts of the course. How could such a statement be defensible?

3. Select a unit of subject matter and indicate what three types of learning could be actuated by its use in the public school curriculum.

4. Using the criterion for the selection of subject matter defend the presence in the high school curricula of the subject you are to teach.

5. What reasons would you give for the persistence of public schools in emphasizing extrinsic values?

6. What is the relation of subject matter to method? The organization of subject matter to method?

7. A high school civics teacher was asked by her principal to teach one group of her classes by a modification of the project method and the rest by the traditional recitation method. In the first case projects of real life problems were initiated in part by the class and in part by the teacher, while in the case of the second group the regularly outlined traditional course of study was to be followed. What would you predict to be the results of such an experiment and why?

8. Miss M., a teacher of ninth-year sewing, recommended to her principal that one of her students, who was failing and who was slowly developing a strong dislike for the subject, drop it. She asserted that it might in some way injure the girl's future. On what basis may her assertion be true?

9. What part or parts of a typewriter may properly be thought of as subject matter?

10. What conditions cause the subject matter used in the public schools to vary?

References for Further Study

Bode, Boyd H., "Modern Educational Theories," Chap. III, The Macmillan Company, 1927.

Collings, W., "Experiment with Project Curriculum," The Macmillan Company, 1923.

Colvin, S. S., "Introduction to High School Teaching," Chap. XIII, The Macmillan Company, 1917.

Holley, C. E., "The Teachers Technique," Chap. XVII, The Century Company, 1922.

Kilpatrick, William H., "Education for the Changing Civilization," The Macmillan Company, 1926.

KILPATRICK, WM. H., "The Project Method," Bureau of Publications, Teachers College, Columbia University, 1918.

"Source Book in the Philosophy of Education," Chap. XIX, The Macmillan Company, 1923.

LINCOLN SCHOOL STAFF, "Curriculum Making in an Elementary School," Ginn & Company, 1927.

MONROE, P., "Principles of Secondary Education," pp. 342–374, The Macmillan Company, 1923.

PARKER, S. C., "Methods of Teaching in High School," Chap. IV, Ginn & Company, 1920.

STEVENSON, J. A., "The Project Method of Teaching," Chap. IV, The Macmillan Company, 1923.

STORMZAND, M. J., "Progressive Methods of Teaching," pp. 328–340, Houghton, Mifflin Company, 1924.

THOMAS, F. W., "Principles and Technique of Teaching," pp. 251–261, Houghton, Mifflin Company, 1927.

WAPLES, D., "Procedures in High School Teaching," Chap. XI, The Macmillan Company, 1924.

WILSON, HARRY B., GEORGE C. KYTE, and HERBERT G. LULL, "Modern Methods in Teaching," Chap. IV, Silver, Burdette & Company, 1924.

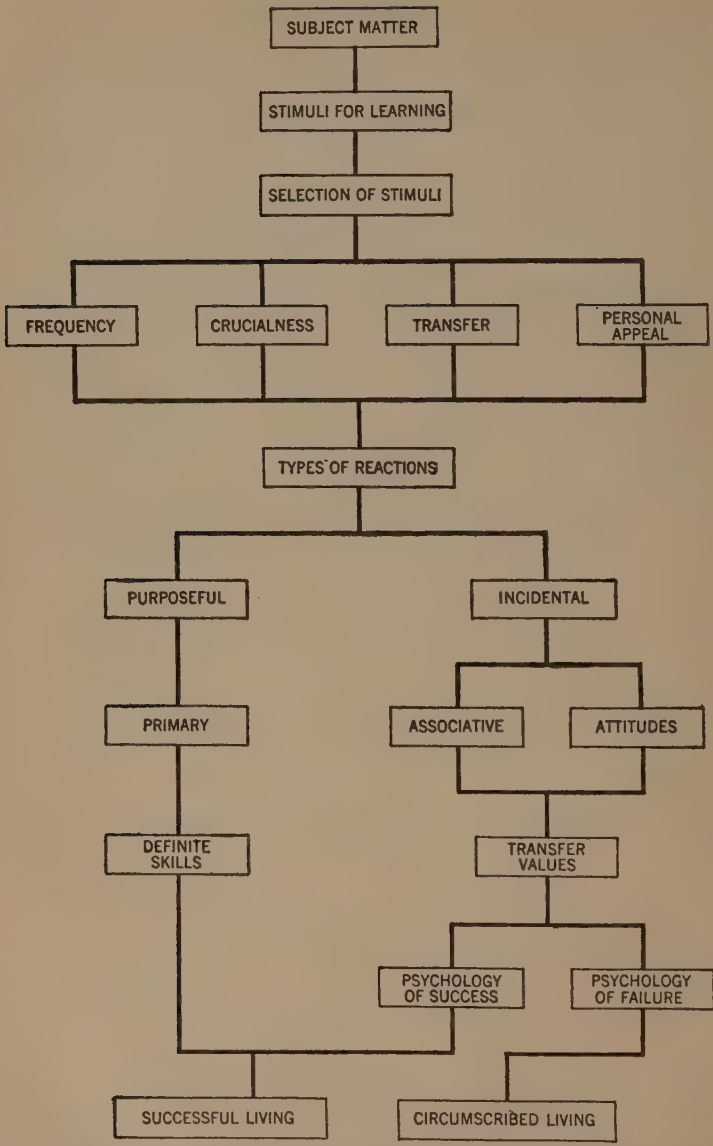

Fig. 4.—Graphical representation of the content of the chapter, Purposes of Subject Matter.

Chapter V

ENVIRONMENTAL AND ROUTINE FACTORS OPERATING IN LEARNING

I. LEARNING IS FACILITATED BY FAVORABLE CLASSROOM CONDITIONS

1. The Teacher Should Control Environment and Routine.—The teacher stands in reference to the children as the director of learning. Acting in such a capacity, it falls to him to see to it that the laws of learning are made to operate to the maximum, with a minimum of useless effort. He should be ever on the alert to capitalize any devices, tricks, mechanical set-ups, or agencies which would more readily facilitate the establishment of new, desirable bonds and the modification of old, undesirable bonds.

It is true that learning can be made to take place under any circumstances, favorable or unfavorable. It is no doubt a fact that a skillful teacher could teach the appreciation of DaVinci's "Last Supper" on a desert island with not even a print of the masterpiece in his possession, assuming, of course, an intelligent student as the learner. Not so many years ago the slate and pencil were the writing materials used in the schools. This condition eliminated all or almost all of the many advantages of paper and pen. It is only within the last few years that textbooks have even approximated adequacy. Yet despite all of these conditions which we now think of as handicaps, learning was accomplished. To be sure it was a more laborious and painful process, but the laws of learning were made to work even though the operation was bunglesome, and there was an attendant tremendous amount of wasted time and effort.

President Garfield once said, "Mark Hopkins on one end of a log and I on the other would make a University." This may indeed be true and it bears out what has been said about the possibility of the laws of learning operating under any given

conditions. But what a hopeless educational program this would establish! Today, through the public schools, we are training great masses of children. Education is rapidly becoming a great economic and social necessity. Every year we witness a greater influx in our elementary, secondary, and higher schools of learning. We have reached the point where our educational system is becoming almost unwieldy. Interpreting this, we find it to mean that greater conservation of time and energy on the part of both the teacher and pupils is obligatory for facilitated learning. We must make increasing efforts to eliminate from the classroom all unnecessary and wasteful procedures in favor of those which are more definitely fruitful of educative results.

The first of this group of conservation features which we wish to discuss are those concerning the physical and environmental conditions of the classroom. It is in the classroom that the teacher operates as the director of learning, for here he comes into direct contact with the mental processes of the children. It is here that he must provide for the adequate operation of the laws of learning. And what a problem it is! In the average classroom we have thirty-five or forty children, each one different in temperament, intelligence, and interests, but all of whom must be made to form certain specific, synaptic connections of the correct strength. The teacher must, obviously, enlist all the environmental aids possible so as to remove all of the unnecessary inhibitions. He should, among other things, know exactly what mechanical features aid and what detract from the learning program and organize the physical conditions of his classroom in accordance.

2. **Mechanical Features Should Pivot about Learning and Economy.**—Every mechanical or environmental feature of classroom organization must be justified by increased results in learning effected on the basis of economy. Observation in almost any classroom will indicate that this principle is most flagrantly violated. On all hands we find great time-consuming efforts to make needless adjustments which in no way lend themselves to the development of the learning process. Many sorts of mechanical devices and countless artificial regulations are

established which are made ends in themselves but which do not contribute one whit to the objectives sought. A case in point is that of the teacher who, during the dismissal of her pupils, would follow somewhat this type of procedure: "One," she would say and the pupils would sit up straight in their seats, hands on the desks, feet flat on the floor; "two," the pupils would slide over to the right side of the desks; "three," they would turn to the right facing the isles; "four," they would rise; "five," they would face the front and march. Another illustration is that of the teacher who, on the first day of school, arbitrarily seated the boys and girls in alternate rows. There are no specific reasons for such types of routine and thus their use as elements of classroom procedure is wasteful.

We frequently find teachers, yes indeed whole school systems, who are veritable slaves to routine. In such cases great stress and much greater energy is directed toward an unproductive regimen of work. Clock-like precision is demanded for the sake of "system" alone, and not because of its greater return to learning. A military control of pupil movements gives the appearance of a well-ordered room and makes an attractive "show" for visitors, but, fortunately, our classrooms have never been designed for exhibition purposes. The problems of directing learning are indeed too excessively intricate in themselves without cluttering the process with unnecessary impedimenta. Successful direction of learning taxes the ingenuity of any teacher to such an extent that the inclusion of unnecessary side play acts as an inhibition to his effectiveness. Every environmental feature and each mechanical process must stand the acid test of educational productivity, and failure in this test should warrant its immediate discard.

It is the problem of the teacher to analyze the various features of classroom organization in the effort to determine a policy which gives us the most adequate layout for learning. We must "set the stage" as it were to accomplish a maximum return in the given time, with least expenditure of unnecessary effort. It is the aim of this chapter to point out some of the desirable environmental and routine factors which, if properly controlled, will facilitate learning.

It must be understood, of course, that many of the features of the classroom are beyond the control of the teacher. There may be, for example, certain violations of standards for artificial illumination such as an incorrect type of lights, improper placement in the room, inadequate candlepower for the size of the room, or others which are permanent building features and thus cannot be changed by the teacher. The ventilating system may be unsatisfactory, but here again the teacher is powerless to remedy the condition. There may be insufficient blackboard space, improper desks, and any number of undesirable building conditions which are not amenable to change because of their permanence, but it is not our purpose to discuss that phase of the problem. Our treatment must necessarily be limited to those physical features which are within the control of the teacher, important as these others may be.

II. FACTORS AFFECTING LEARNING AND HEALTH

1. Lighting.—Too much or too little light acts as a distraction to pupils during the process of learning. Just recently the writer visited the room of an experienced teacher who paid but little attention to the proper adjustment of light conditions. The shades were arranged in her classroom in such a way that one child during study was looking into the direct rays of the sun. It caused him to squint and shift about uneasily in his seat and he was, without doubt, decidedly uncomfortable. This condition definitely inhibited learning. It resulted in a focalization of his attention on his discomfort, which made concentration upon his study most difficult, for concentration consists of the selection of attention on those stimuli only which produce desirable reactions.

Teachers should exert meticulous care to see that the light conditions of the room are satisfactory for each child. A single adjustment of the shades in the morning will not suffice, for natural light conditions are continually changing. If a pupil is working with shadows on his book or paper, a distraction of another type is experienced, for a more than necessary effort to see clearly is demanded; an excess of nervous energy is needlessly

required. Proper selection of blackboard space for demonstration purposes should be made. A glare reflected from the blackboard not only produces eye strain but also makes it impossible for the students so affected to see the work.

Aside from the fact that improper lighting is an inhibitive force to learning, it is an elemental cause of ill health, for it produces excessive eye strain. We have mentioned that one of our major objectives in education is to inculcate habits of health in the minds of the students, hence we should eliminate those phases of classroom control which are incongruous with the health program we are endeavoring to establish. It is too often true that teachers "preach" one thing and forthwith "practice" the opposite.

Of course, with the multitude of duties with which the teacher is confronted, it is difficult for him continually to hold the problem of lighting for each child definitely in mind. The children themselves should be made to feel perfectly free to make any needed adjustment to insure better lighting conditions. In fact, it should be part of the "socializing" program to have this, and many other similar types of responsibilities, placed on the members of the class. With the combined attention of the students and teacher on factors of this sort, unfavorable working conditions can be reduced to the minimum.

2. **Heating.**—Excessive heat or cold has as bad psychological effects on the students as has light. It produces physical discomfort which takes its toll in the lack of concentration on the task at hand. The Strayer and Englehardt score card for buildings sets the ideal classroom temperature at between 68° and 70° Fahrenheit. This temperature is sufficiently cool to be invigorating and not so warm as to produce lethargy. A lethargic condition is not one of so-called "mental fatigue," which has been proved not to exist, although it is sometimes classed as such. It does, nevertheless, interfere with learning for it takes unnecessary effort to hold to the task when one is sleepy and sluggish.

Many devices are used by teachers to check on the temperature at critical periods of the day. One that seems to work out very satisfactorily, and which utilizes student responsibility, is

the use of a student-operated temperature chart. Such a chart may be either printed or mimeographed. It can be designed to record temperatures for a period of one week, taken four times a day. The reading periods should be near the beginning and middle of each daily session. Taking the temperature at the beginning of the session provides for a correct start, while recording it near the middle allows for any necessary adjustment to be made at a vitally important time. The monitor in charge should be trained to adjust the heat regulator to meet the conditions found by his observations. Such a monitorial system takes at least part of the responsibility from the teacher and places it with the students, the desirability of which practice we have already mentioned.

Considering the problem further from the viewpoint of the children's health, the principles of hygiene demand constant vigilance on the part of teachers to the conditions of proper temperature control. We learn from them that illness results as readily or more readily from overheated rooms as from those excessively cold. Wide fluctuations in temperature are a prolific cause of colds, especially if there are draughts.

The practice followed by some children, sometimes at the suggestion of parents, of retaining heavy wraps during the school day should be discouraged. The school temperature is sufficiently warm to provide health and comfort for those normally dressed. Thus those wearing heavy sweaters, coats, and other such garments must necessarily be dressed too heavily. Heavy outer garments are for use in severe weather out of doors, but when used indoors their protective values are reduced. For reasons of health, rubbers, overshoes, and the like should be removed during school hours.

3. **Ventilation.**—Vitiated air in a classroom has just as deleterious an effect upon learning as has improper temperature. It produces an attitude of drowsiness and ennui which requires a maximum of working effort and no little will power to overcome. It results in a real distraction which is needless and which can be remedied with readiness and dispatch with the exercise of proper care.

To insure proper ventilation, the teacher must thoroughly understand the operation of the ventilating system in vogue. Some systems, for example, cannot function properly with open windows and thus the teachers who try to ventilate in this way upset the whole ventilation scheme for the entire school. It should be one of the first duties of a teacher new to a school system to make careful inquiries into the operation of the ventilating system in her room. The writer knows of the case of a teacher new to a certain school system who, for the first six months, did not know that she could completely change the air in her room by simply pulling down the chain in the ventilating shaft. There is no excuse for such ignorance.

It seems needless and almost irrelevant to speak of such obvious features of classroom management as light, heat, and ventilation. One would think that common sense alone would direct the teacher's activities along these lines. But it is a recognized fact that such factors are quite regularly ignored. It is not difficult to find classrooms where the lighting, heating, and ventilating conditions amount to criminal negligence. The cause for such flagrant neglect is, without doubt, a lack of understanding of the close relationships of such physical factors to the operation of the laws of learning.

III. FACTORS AFFECTING LEARNING AND ECONOMY OF TIME

1. Seating of Pupils.—A safe rule, and perhaps the only one to follow here, is to seat pupils where they can do their best work. There is no good reason why students should not be allowed to select their own seats on the opening day of the school year. Such freedom of choice will, in a small measure, help to soften the rigid formalistic atmosphere in the school, which, according to our present notions, should be eliminated in favor of freedom.

Permitting a free choice of seats leads to the possibility of friends' sitting in close proximity. The development of this condition is often pointed to as an objection to the plan on the basis of its being a stimulus for disorder, but this "grave danger" is more apparent than real. Should such a seating arrangement prove to be conducive to infractions, the difficulty can be quickly remedied by simply "breaking up the combination." There can

be no question that the advantages of free choice easily outweigh its disadvantages. In addition to the satisfaction following the freedom allowed, there is another advantage of a social type. Friends play together, and thus to work in close proximity accentuates the social relationships to some extent, even though this work situation is a highly diluted form of social contact. We must capitalize all desirable types of social contacts, for to do so aids in the process of socialization as well as adds the element of satisfaction to such procedures.

After the students have made a choice of seats, it should be understood that this selection is subject to change as the conditions warrant. The teacher should carefully scrutinize the class to ascertain whether or not the seats "fit" the pupils. An improperly adjusted seat or desk is harmful to the health of the pupils, besides being a distracting element to learning because of the discomfort. A desk which is too low requires the student to stoop, causing him to round his shoulders and contract his chest and lungs. On the other hand, when a seat is too high it forces the child to stretch to reach the floor or prompts him to slide down in his seat and thus arch his spine. This condition detracts from learning and is likewise harmful to health, resulting at times in permanent spinal disorders of a serious nature.

In almost every classroom there are students who are suffering from defective vision and hearing. They should be seated so that they will be in the best possible positions to see and hear all of an instructional nature that takes place in the classroom. Further, troublesome students should be placed where their undesirable activities may be reduced to a minimum and the effects of these acts will have the least harmful influence on the rest of the group.

The seating problem in the classroom, in reality, demands but little more than common sense to perform the necessary adjustments. After the seating arrangements are definitely established, the roll call may be easily effected by use of a seating chart. Such a device necessitates a permanent adjustment and eliminates the need of resorting to the time consuming practice of calling the students' names. A mere glance over the classroom quickly locates the absentees.

2. Use of the Blackboard.—American schools are noted for their abundance of blackboard space. In almost every school of today we find sufficient area to accommodate at least a large fraction of the class. It is, indeed, unfortunate that more use is not made of this valuable device, for through such use the teacher comes in direct contact with the pupils' minds at work. Again, it offers boundless opportunities to display valuable illustrative materials; for there is no limit to the number and variety of charts, graphs, diagrams, outlines, and the like that the teacher can expose, at will, for the use of the students.

Unless the use of such descriptive material becomes necessary because of some exigency arising in class, it should be put on the blackboard at a time previous to the recitation period. Much valuable class work is lost by teachers' copying work on the blackboard when the time should be given over to more important matters.

All blackboard material should be so placed that it can be easily observed by all. Whenever possible, the space in the front of the room should be utilized. All types of such visual material prepared by the children themselves should be written or drawn large enough for all to see and the teacher should insist upon a high degree of legibility. Frequent cleaning of the slates to retain the full black appearance is an essential requirement, for the greyish black of dust-covered slates does not furnish enough contrast to make the writing easily discernible by the children.

Much time can be wasted by incorrect use of the blackboard. There is, of necessity, much more freedom in its use than in seat work, and, unless careful safeguards are taken, undesirable activities on the part of the students may creep in. One prolific cause for disorder is the scramble for space when students are sent to the blackboard for work. This can be obviated by assigning a definite amount of space to each pupil to be used by him whenever he is sent to the blackboard. One teacher accomplished this in a very effective manner by cutting numbers about an inch square from a large calendar and pasting them near the top of the slates. In this particular classroom it allowed for twelve spaces relatively equal in size. She then divided her class into three sections, numbering each from one to twelve. When

the occasion arose for work at the blackboard, she assigned the students to it by sections, each one taking his or her place without confusion.

A systematic traffic system of passing to and from the blackboard is a desirable feature. The geographical conditions of the room will determine just what sort of routing this will be, but the objective should be to secure the swiftest shift with the least possible confusion. Experimentation alone will reveal the nature of this plan, and no fixed method should be instituted until several have been tried out and the results observed.

The reader has undoubtedly been in classrooms where the blackboard has been usurped by large, ornamental calendars or other decorative features of a more or less permanent nature. This decreases the amount of working area. The blackboard never was and never should be a place for classroom decorations or permanent records. It is an instructional device and should be reserved exclusively as such. Of course there may be exigencies demanding its temporary use for other purposes, but these occasions should be infrequent and of the most temporary sort. Blackboard space is precious and it should be carefully guarded for the students' use. We have yet to find the classroom with too much blackboard area.

Another source of waste is found in the practice of some teachers who set one group of pupils to work at the blackboard while those at their seats are idle. The writer observed a teacher who sent half of her class to the blackboard to work out algebra examples while the other half, who remained at their seats, were instructed to "see where those at the blackboard make their mistakes." Most of the "seat workers" utilized this part of the class procedure for a "breathing spell" and mere idleness followed as a result. A good aim to strive for is to keep each member of the group working to capacity during each minute of the period. This is idealistic to be sure, but it offers us a challenge to ever increasing efficiency. It has a wholesome effect on us if we interpret student idleness as lapses in the efficient control of our class procedure.

Unless we provide for individual differences in our blackboard technique, we encounter another feature of the same problem.

On a given assignment we are likely to find as many rates of speed for its completion as we have participants, but economy demands that there be no idleness on the part of those finishing first. To assign one task at a time, and then to hold up the entire group until all have finished, is wasteful. In general, it is desirable to assign a sufficient amount of blackboard work at a time to insure continuous activity on the part of fast workers so as to facilitate their working up to capacity.

3. **Care and Use of Instructional Materials.**—Every well-equipped room will have an abundance of charts, globes, reference material, and other apparatus of value for individual use as well as for group instructional purposes. The utilization of such materials should not be made the occasion of rare experience but should be a necessary factor in each day's procedure. It is obvious that much individual freedom must be permitted to encourage students to make such material part of their own personal equipment in study.

To make this equipment easily available for daily use, it should be placed where it is accessible to all. The apparatus should be conveniently located in cabinets with a definite place for each article, and when any part of such equipment is not in use it should be in its appointed place. Reference books should be carefully cataloged, and when they are borrowed for overnight use, a careful record should be kept. All such routine entails much work and careful organization on the part of the teacher, but it will be found that the returns in economy of time, and in the protection of the interests of the class as a whole, warrant the use of such system.

The battered and mutilated condition of much of the instructional apparatus and other equipment found in some schools is an eloquent commentary on the type of morale of these systems. It should be part of the program of each teacher to see to it that such school property is carefully protected against misuse. This is in direct line with our social objectives in education and herein is afforded a real opportunity to drive home some lessons in good citizenship. The same holds true concerning the care of the desks, and the walls of the classroom, and the school

building in general. Mutilation of any sort usually indicates the failure of some teacher.

A great economy of time can be effected if the teacher will insist upon the students' organizing their own personal materials preparatory for some phase of classroom activity. Thus, if written work is assigned to be done in class, it is well to take a moment at the beginning of the period to ascertain if all are provided with the necessary supplies. Some students, for example, never think of sharpening a pencil until after the written lesson is well underway.

4. **Classroom Housekeeping.**—Did you ever look inside the desk of a student whose teacher paid no attention to orderliness? Unless that student has been thoroughly trained in habits of neatness at home his desk will, quite likely, be in a state of great confusion. This condition leads to much useless consumption of time, for without orderly arrangement of books and supplies it takes much maneuvering to locate a needed article. Oftentimes written work and books become lost in the jumble.

Neatness is a habit which can be cultivated and one field for its practice should be the classroom. This does not necessarily mean that neatness should be one of our most important objectives, as some teachers seem to feel, judging from the overemphasis they place upon it. Rather, it means that through the establishment of habits of orderliness, neatness will follow. But, again, another caution: The classroom is a workshop and we must be sure that we are not sacrificing some specific ends to accomplish subsidiary objectives. A case in point is that of the teacher who required the pupils to pick up immediately all papers which they dropped on the floor. This meant, of course, that students must interrupt their work in order to keep the floor clean. Such a case is illustrative of sacrificing the end for a matter of minor importance. All details of this nature must be settled on the basis of relative values for we must, of course, place "first things first."

It should not be necessary to speak of the teacher's influence in the matter of neatness. It is a readily recognized fact that students are either consciously or otherwise influenced by the

teacher. One whose desk looks as though a "hurricane had struck it" is in a poor position to direct his students to be neat. He must, obviously, first clean house himself and set the right example. A teacher cannot consistently sell a commodity he himself does not possess.

A splendid practice which brings big returns in neatness and care of property is to institute some sort of periodical inspection of all types of material equipment. It should be understood by the students that the building and its equipment is in their care and that it is their duty, as good citizens of the school, to protect it. Many teachers effect this type of inspectorial service by use of student committees. Upon order of the inspection committee, students are required to remedy the condition of overloaded and untidy desks. Any defacement of the desks or other school property is investigated and reparations exacted. In case of flagrant or malicious destruction, proper punishment is suggested. By such procedure the student's responsibility for the care of school property is emphasized.

5. **Classroom Bulletin Board.**—The bulletin board is an excellent classroom device, for it affords unlimited opportunities for the display of visual material of many different sorts useful in teaching. A fixture of this sort can be installed with but slight expenditure. A soft pine surface covered with green burlap and bound on the edges with inexpensive molding is one of a very serviceable type. Any school janitor can construct such a bulletin board.

There is a limitless amount of bulletin board material available from a great variety of sources. Newspapers, magazines, and pamphlets of many kinds furnish a fund of matter worthy of posting. Such exhibitions, in addition to being informative, stimulate an active interest in current events. Charts, graphs, class written work, and other such instructional material, as well, may be displayed upon it.

Again in the use of the bulletin board, we are afforded another agency for the stimulation of student responsibility. By encouraging the members of the class to contribute exhibition material, two outstanding advantages follow. In the first place, such

practice stimulates an active search through current periodicals for worth-while material. They cannot do this without developing the much-needed practice of reading about matters of current interest. In the second place, a genuine satisfaction results from contributing material which is beneficial to the welfare of the group.

6. **Collection of Papers and Distribution of Supplies.**—All matters pertaining to the distribution of materials should be carefully systematized to eliminate waste. One teacher was observed who lost from two to five minutes each day in returning the students' corrected papers. This time could have been saved almost completely had the teacher arranged and distributed the papers from her seating chart before class time.

No hard-and-fast rules can be established concerning the distribution of materials. Some teachers prefer to place a sufficient quantity on the front desks, each student helping himself as they are passed to the back. This seems to be a very economical method. Other teachers have monitors in each row who pass out the materials. This method is more time consuming than the former and thus is not so effective.

Before the opening of the school session, it is well for the teacher to take an inventory of all supplies she will need during the day, and then see that these supplies are on hand. The writer recalls the case of one teacher who started a class period in European history by announcing that this day they would begin their work with a rapid map review. She turned to the place where she had hung the map at some previous time but found it was not there. She dispatched a boy to the supply room to secure it, meanwhile the rest of the class was inactive. Soon this boy returned with the information that this particular map was not in its accustomed place. He was then sent to different rooms and after some little time it was located. But all of the time consumed in securing the map was wasted. Such a condition indicates a flagrant disregard for the conservation of time and is indeed an indication of weakness, easily but infrequently remedied. Such a laxity of systematic organization cannot be excused and furthermore should not be tolerated by school authorities.

7. **Use of Duplicating Apparatus.**—In most schools we find either a mimeograph or a hectograph as a part of the regular equipment. By means of these duplicating devices, the teacher can place in the hands of each child copies of diagrams, drawings, outlines, notations, problems, and other illustrative and instructional material prepared by himself. The use of duplicated material makes possible a great saving of time, for it eliminates the taking of dictation or copying from the blackboard. The writer observed a teacher who frequently spent approximately one half of the regular class period dictating outlines for the students' notebooks. These outlines were splendid in themselves but had they been prepared by some duplicating method all of the time would have been saved for more important matters.

Problems and Exercises

1. A teacher in the seventh grade encountered great difficulty in the case of some of her students who persisted in mutilating their desks. She found that reproof did not remedy the condition. Suggest a program involving the use of social features which could be used to solve this problem.

2. Discuss the advisability of instituting supervised marching for dismissal in (*a*) the senior high school, (*b*) the junior high school, (*c*) the elementary school.

3. A teacher found it difficult to control the conditions of light, heat, and ventilation along with all of her other duties. Work out a monitorial system which would relieve her of these responsibilities.

4. Enumerate different types of material suitable for use on a bulletin board in the subjects you expect to teach. From what sources could such material be secured?

5. A high-school teacher of beginning French, who made much use of the blackboard, experienced difficulty in keeping her students in order while they were passing to the board and while at work at the board. Much time was consumed by such irregularities. Map out a room plan and devise a suitable traffic system for such a room. What suggestions would you give the above mentioned teacher to assist her in eliminating the confusion caused by her students while at work at the blackboard?

6. What factors of routine should be explained to a new class during the first week of school? According to what plan should other necessary factors be made known to the students?

7. Enumerate the classroom environmental factors that are and those that are not in the control of the teacher.

8. A teacher of history had a splendid bulletin board located in her room upon which she exibited materials collected by herself. She, however, had difficulty

in getting the students to collect and submit material of their own. How may this be accomplished?

9. A seventh-grade teacher had the routine of her class so highly mechanized that the students inwardly rebelled. Whenever possible they proceeded to "break the rules of the system." Work out a set of criteria to be used by this teacher in the selection of pertinent matters of routine.

References for Further Study

Ayers, Williams, and Wood, "Healthful Schools," Houghton, Mifflin Company, 1918.

Bagley, W. C., "Classroom Management," Chap. VI, The Macmillan Company, 1914.

Bennet, H. E., "School Efficiency," Chaps. III—X, Ginn & Company, 1917.

Burton, W. H., "Supervision and the Improvement of Teaching," Chap. III, D. Appleton & Company, 1922.

Davis, S. E., "The Work of the Teacher," Chap. IV, The Macmillan Company, 1918.

Dutton, S. T., and D. Snedden, "Administration of Public Education in the United States," Chaps. XI, XII, The Macmillan Company, 1913.

Dressler, F. B., "School Hygiene," The Macmillan Company, 1916.

Hall-Quest, A. L., "Supervised Study," Chap. IV, The Macmillan Company, 1923.

Judd, C. H., "Introduction to the Scientific Study of Education," Chaps. VI, XX, Ginn & Company, 1918.

Parker, S. C., "General Methods of Teaching in Elementary Schools," p. 71, Ginn & Company, 1922.

Sears, J. B., "Classroom Organization and Control," Chaps. II—X, Houghton, Mifflin Company, 1918.

Stark, W. E., "Every Teacher's Problem," Chap. X, American Book Company, 1922.

Strayer, G. D., and N. L. Engelhardt, "The Classroom Teacher at Work in American Schools," Chap. XI, American Book Company, 1920.

Terman, L. M., "The Hygiene of the School Child," Houghton, Mifflin Company, 1914.

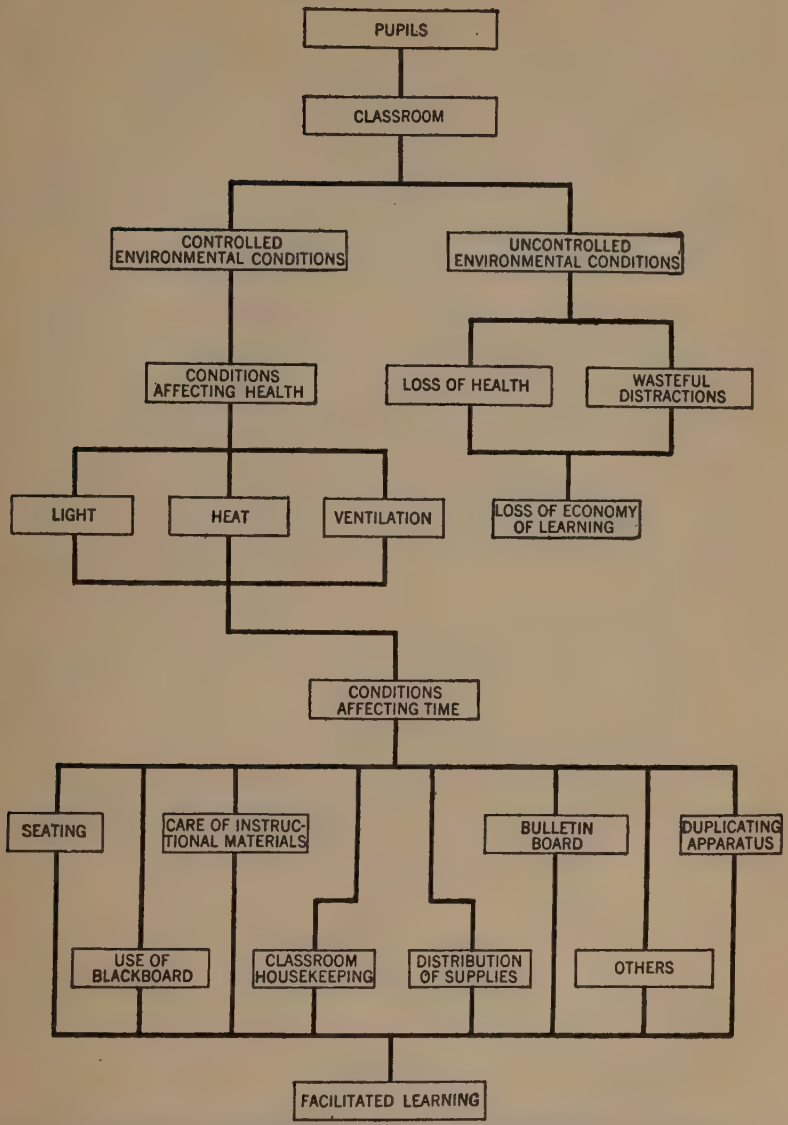

Fig. 5.—Graphical representation of the content of the chapter, Environmental and Routine Factors Operating in Learning.

Chapter VI

INDIVIDUAL DIFFERENCES AND THEIR EDUCATIONAL IMPLICATIONS

Probably since 1915 no phrase has been more often quoted in educational literature, and in conversation and discussion of matters educational, than has the term "individual differences." Without doubt many of the connotations of this term have been recognized as existing, but no phrase had been coined to express these vague ideas until recently. This condition is not unusual. Principles are always of most value when they express ideas that are easily demonstrable, even if not perfectly obvious.

One of the frailties of humanity, however, is to use a perfectly good idea as an ultimate end in itself. It is not unusual to be perfectly satisfied when a pleasing terminology has been applied to a situation, under the impression that when that condition is recognized and classified it has been fully provided for. Such use of a happy term is using that term as an end in and of itself which, to say the least, is futile. The end is not what to call a condition but what to do with it. It does not seem that the educational world has done so much about individual differences as it has talked about the fact that they exist.

I. DEFINITION OF INDIVIDUAL DIFFERENCES

Upon first thought it would seem that no definition of this term would be needed. Both words when used singly are perfectly clear to practically everyone. Yet when the words are combined, the resulting term is not so easily defined. In fact it can scarcely be defined, except by rather lengthy illustration involving some understanding of the normal curve of distribution. With this in mind an effort will now be made to present illustrative material which will make the meaning of individual differences clear.

To begin deductively, let us say that all natural things in all the world, when measured as to any single trait, probably distribute themselves upon what is known as a normal curve.

At the risk of making the discussion seem elementary, an attempt is made to use first an illustration that cannot fail to be understood. Suppose one were interested in the length of the index finger and decided to collect data thereon. If the purpose were to get the range in length over which index fingers might vary, the problem would be solved if he could go directly to the one person in all the world who has the shortest and to the one who has the longest index finger and subtract the shorter from the longer. The difference would be the range. But there is no way, except by comparison, that the two persons, one having the longest index finger and one the shortest, can be found. To be absolutely certain, the index finger of every person in the world would have to be measured. Obviously, such painstaking would be endless and perhaps useless. What we do is to measure a large number of index fingers from an unselected group of people. By "unselected" is meant that those measured should be somehow chosen at random and not because they have long, short, or medium-length index fingers. Enough should be measured so that there is little reason to believe that another index finger might be found which would be longer or shorter than that of some one already measured. When this is done it is said that a random sampling has been accomplished.

Now the fact is that random samples of so many different natural traits have already been measured, and the measurements always found to fall on the normal curve, that it seems best at this time to explain fully the normal curve of distribution.

II. THE NORMAL CURVE OF DISTRIBUTION

The normal curve of distribution is an exact mathematical figure. It is obtained from a quadrant one-fourth of a circle. Referring to Fig. 6 the reader will easily see that in the quadrant *ABC*, if *OD* is erected halfway between *B* and *C* it will bisect line *BC*. Now if it is, also, erected perpendicularly to *BC* it is known in mathematics as an ordinant of line *BC*. The reader will recall enough of

his geometry to know that mathematicians would be readily able to calculate the length of line *OD* and its relationship to *BC*. For example, if the line *BD* be drawn, *BD* being the radius of the circle and *BO* being one-half the radius, we have two sides and one angle to find the opposite side.

It would involve too much complicated mathematics and would serve no particular purpose to explain fully each step of how the normal curve was originally obtained, but it will suffice to say that

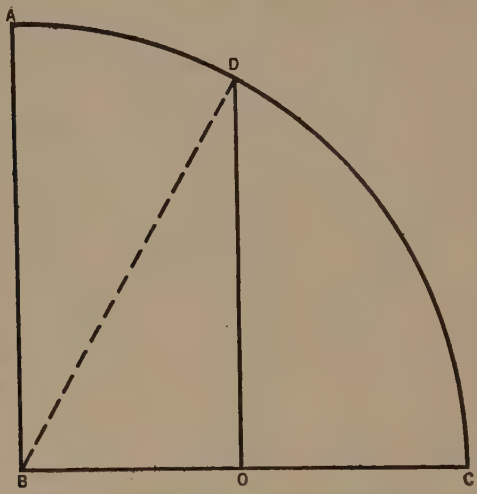

Fig. 6.—Graph showing the mathematical origin of the normal curve.

tables have been compiled, such as are to be found on page 388 in Dr. H. O. Rugg's book, "Statistical Methods Applied to Education," which give, in full, the directions for plotting a normal curve.

Briefly, the directions would be to take cross-ruled paper and lay off a base line of any desired length for the normal curve. Now since the mathematicians know the relation of *OD* to *BC* the table can tell the length of the perpendicular to be erected in the middle of the base line which has been laid off. When the perpendicular is erected, the squares of the cross-ruled paper will serve to make the points to be marked easy to locate. Suppose for instance, it is found that the line which corresponds to *OD* is

as long as 100 squares. Then starting at the top of *OD*, and dropping down one square, the table will tell how many squares or parts of squares you must go out on the side of *OD* to make the first point of a series of points, which are to determine the course of the normal curve line which you wish to draw. Continued consultation of the table will enable a point to be located on each line of squares until the base line is reached. All that remains is to draw a line through these points, then if the points have been located on each side of *OD* and the line drawn through them from

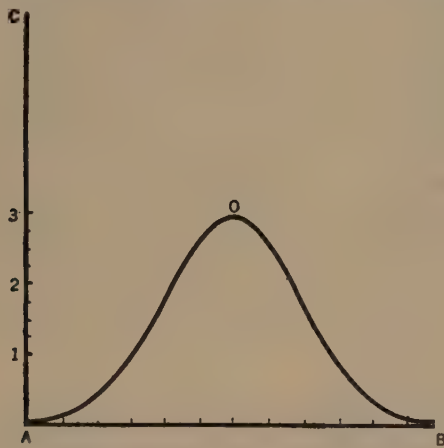

Fig. 7.—Graph showing the distribution of the length of index fingers.

the base to the top of *OD* on both sides of *OD*, the result is a graph of the normal curve of distribution and looks like the curve *AOB*, of Fig. 7. It will be seen that the normal curve is a graceful, bell-shaped figure and is perfectly symmetrical.

To show the use of the normal curve let the line *AB* in Fig. 7 represent the range of the length of the index fingers which have been measured, say in all 80,000. The line *AC* represents inches and each space one-fourth of an inch in length. Of 80,000 persons measured, very few indeed would have as little as one-quarter of an inch of index finger so that the curve would be close to line *AC*, but those having from one-half to three-quarters would be more numerous, and so forth until you reach, say three inches which we will say is the average length. Here the curve

reaches its highest point and begins to descend. The same argument holds for above the average length so that the right side of the curve is symmetrical to the left.

The normal curve was first laid off by mathematicians to graph the functioning of the law of chance. For illustration, suppose eleven pennies were put in a hat and shaken up and turned out. Seldom would one get eleven heads and seldom eleven tails. These events would be represented on the opposite end of the curve. A little oftener one would get ten heads and one tail or ten tails and one head, still oftener nine and two, oftener eight and three, and most often six and five. The results of thousands of throws would result in a curve approaching so closely to a mathematically exact normal curve as to be, to all intents and purposes, the same thing.

Fig. 8.—Column diagrams of the law of chance as obtained from the expansion of a binomial or from tossing eleven pennies.

Still another way of getting the data on the law of chance is by use of the binomial theorem for the expansion of some indicated power of the sum or difference of two algebraic terms. To get a perfect curve, a very high power of the term would have to be used but for our purposes we may use some small power, say 11. Then we would have $(a + b)^{11} = a^{11} + 11a^{10}b + 55a^9b^2 + 165a^8b^3 + 330a^7b^4 + 462a^6b^5 + 462a^5b^6 + 330a^4b^7 + 165a^3b^8 + 55a^2b^9 + 11ab^{10} + b^{11}$. Now, using a as the penny head and b as the tail we would have a graph of the results of the throws as in Fig. 8.

The normal curve, then, is not an artificial device used to persecute either pupils or teachers. It is the graph of the law of chance. But the law of chance is not the fickle thing that most people

think it to be. It is merely a general statement of how natural things, taken in entirety, do really occur and exist in this world of ours. By knowing this relationship of their existence, we may take any single one of them and see how it compares with the rest of its kind. We can see if it is among the very few lesser ones of its kind or among those that are average, being neither little nor great, or if it falls among the extremely few representing a very great amount of this particular attribute.

In a word, the normal curve of distribution is the only scientific measure, by comparison, which we have. Any one of the units of the things being measured on it can be spoken of understandingly.

Intellect or intellectual ability, taken as a unit or divided into simple specific reactions, is distributed among the people of the globe according to the law of chance and can, therefore, be plotted on the normal curve. In other words, the ability to do mental work in general, or a single mental task, is distributed among people according to the law of chance. But the law of chance is a fact of happening, not a cause of what happens. We differ as individuals according to the law of chance, but chance does not cause these differences.

III. CAUSES OF INDIVIDUAL DIFFERENCES IN MENTALITY

Traces are to be found in our institutions, traditions, and customs which indicate that in times past, as well as in the present, certain factors have been believed to cause individuals to differ in mental ability. Among these, accepted at one time or another, are sex, race, family, maturity, and environment. Let us examine them in the order named.

1. Sex.—Thorndike concluded that sex was so insignificant as a cause of individual differences in mental ability that it could be disregarded. He does think that the range of ability is greater in men than in women but so little greater that it would mean but very little if thought of in percentages. He says that, probably, women vary 95 per cent as much as men. But this seemingly

small difference is so important that it has not been allowed to stand unchallenged, for it would mean that most of the far outstanding characters of the world would be men. To date, this is true. So it is likely that Thorndike took what has seemed to be as proof of what is. By actual count many more men are numbered among the world's greatest great than women. But this is perhaps due to the subservient position that woman has occupied and not due to her lesser mentality. Again, Thorndike seems to have thought, at one time, that the most depraved persons were men. If this were true, a normal curve would seem to demand a greater number of male geniuses than women. But the males, being of greater strength, are more often adjudged a social menace than are women. This accounts for the fact that more males than females of a given degree of insanity are found in institutions. To conclude, there is no reliable evidence yet produced which shows that either sex is by nature mentally superior to the other.

2. **Race.**—The same is true of racial differences. There is no doubt that ages of a higher degree of selectivity have made some very slight differences in the mental expectancy of the races, but this advantage or disadvantage to any race is very slight.

3. **Family.**—With the family, the case is somewhat different. As soon as one takes a subject from a given family he begins to encounter the effects of selection. What one does is to change the point around which the individuals may vary. Suppose curve *ABC* (Fig. 9) represents the mental ability of all animals that have legs, including insects, monkeys, etc. It will probably pass unchallenged that the curve representing only monkeys would be higher up the scale as *DET*. Now what has happened by taking a selected group? The normal variation is still there, but the point around which the selected group varies is *EX* rather than *BO* around which the whole group varies. The mosquito might fall on a small curve toward the low end of the scale *ABC*.

So it is with man. If *ABC* represents a given race, then a selected family of that race will vary around its own central

tendency which may fall either below or above that of the whole group.

Family, then, has a tremendous influence upon our native mental ability. If the reader is not familiar with the Jukes and

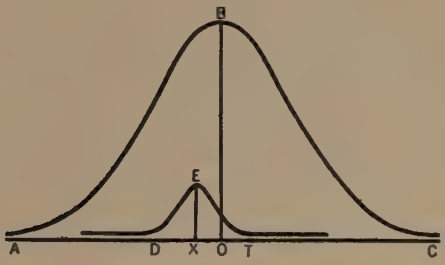

Fig. 9.—Graph showing the probable distribution of two groups, one wholly within the other but varying around two separate points.

Kallikak families as examples of the degenerated lines, and with the Jonathan Edwards family as an example of the opposite type, acquaintance with this information would be very helpful.

4. **Maturity.**—At birth a normal baby has a perfect little hand but the hand is not strong nor is it very useful. It is

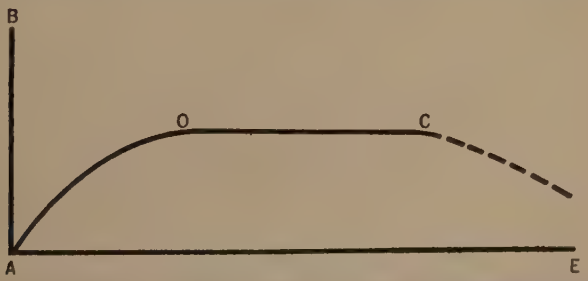

Fig. 10.—Graph showing the natural growth of a human trait from birth to maturity.

complete. It is in proportion to the rest of the body. Does it grow as time passes? Likewise, contrary to a commonly mistaken notion about the intellect, intelligence grows from birth to mental maturity. When the individual reaches mental maturity his mental capacity remains on a level until mental

senescence sets in. The curve representing growth for the average person is alike for both physical and mental growth. It is what we call a negative accelerated curve. That is: the greatest relative growth is registered in the first year, less in the second, still less in the third, etc., until maturity is reached, when it ceases. In Fig. 10, *AB* represents the amount of growth, *AE* the span of life, *AO* the rate and amount of growth. At *O* maturity is reached, at *C* senescence sets in.

It is not meant that the IQ changes. But the IQ is merely a ratio of intelligence to years. Obviously, as the years increase the intelligence must increase or the ratio could not remain constant.

5. **Environment.**—Environment was, at one time, thought to be a much more potent factor in intelligence than we now know it to be. It is difficult to understand this error. Certainly if faith in education could have solved the problem, most people would be highly intellectual. It seems that but yesterday, men could see only the far ends of the scale of individual differences. At one end was the hopeless idiot, at the other the genius. Somehow it was felt that genius was only a matter of taking infinite pains with one's work. But the status on this point is now too well established to need further discussion here.

In a word, heredity, or the original nature, or original capacity of any given individual determines how difficult a task that individual can do if he try. But environment determines what kind of tasks he will have access to, and therefore what he will do. An Eskimo with an intelligence greater than any other man in the world would probably not build an airplane. Christopher Columbus did not learn to ride a bicycle. He had the inherited capacity to learn, but not the environment necessary. The reverse is true of a hopeless idiot.

IV. CORRELATION OF DIFFERENT MENTAL TRAITS IN THE SAME INDIVIDUAL

The idea that people are eye-minded, ear-minded, tactile-minded, and that they have ability in arithmetic but little or

none in spelling, and other such discrepancies, is probably not only an erroneous idea but also an idea that has led to much actual wrongdoing, to say nothing of enormous sins of omission, all in the name of education.

It is true that pupils do learn some things and fail to learn others with anywhere near the same ease. The fault is not, nowadays, looked upon as a mental defect but rather as a fault of the school. It may be in the organization, the administration, the methods, the environmental conditions—the last includes teacher personality, knowledge, and skill.

The much overworked term "natural aptitudes" may exist and remain in large part to be accounted and provided for, but in many cases this term is only an excuse for allowing a boy or a girl to follow some phase of work beyond the point of greatest profit. The real reason for the unusual interest may be any one of a number of conditions, among which are laziness, physical handicap, histrionic influences, previously poor teaching, and others. It will be better to excuse a pupil from his full variety of tasks, on the theory of aptitudes for some other task, only as a very last resort. Then, it probably means that the teacher is at her wit's end, rather than that the child had a decided and outstanding ability in one line as against little or no ability in other lines.

To sum up, it may be said that there has been found to be a great amount of correlation among the several types of school work, and that those who are good in one subject should be good in others. At any rate, the burden of proof should be upon such a pupil and he should be made to demonstrate, beyond a reasonable doubt, that his ability in limited ways is due to aptitude, rather than some maldajustment which, unless corrected, will be an ever increasing injustice to the best of which he is capable.

Now that we have examined the most accepted facts concerning individual differences, what use can be made of these facts? The ideal would be to have such an organization that the groups would be sufficiently homogeneous that no one would suffer undue injury as a result of membership in his group. Secondly, to have work for each pupil which would somehow cause him to realize to the full not merely a few but all of his latent powers for better living in a social group. Lastly, to have him directed so that he

will not waste either his time or his energy. Undue emotionalism, be it hate or of a different variety, may be much more harmful than mere idleness.

But what shall we do about these matters here and now? If the ideal is proper grouping, proper subject matter, and proper teaching, what is practical and what is possible? The answer to these and similar questions is, why not the ideal?

Proper grouping does not, necessarily, mean physical separation. In fact this separation of sheep from goats, of big from little, of young from old is not done in life, and what is not done in life should not be done arbitrarily, and without due consideration of all ramifications, in a school. Proper grouping means, first of all, that one be not forced to compete in work of equal difficulty with those not having equal equipment, both mental and physical, for the work. The native sense of the children would take care of this if given the opportunity. Children are social creatures and to a degree capable of dealing with individual differences in their social work and play. Watch them. In their play they will "caste" the youngest for the youngest roles. In their work, there may be a tendency for the older, in very small groups, to impose upon the younger. But in a large group where will be found an outstanding leader, this leader will seldom allow such petty imposition upon the youngest.

With a few children, size may determine mastery, but in a larger group the real leader will take a higher delight in seeing that justice is done than could possibly be attained for such a leader by subjecting the young and helpless to do the harder parts of the games and of the work. We need to study the native good sense of our children.

As to proper subject matter, or what to have our children learn, it must be said that this is still a riddle. We have gone a long way in forsaking the strangling doctrine of unlimited, formal discipline. But we need much more democracy in our schools than we have at present. Democracy is social control in all phases of life, by natural forces in life itself. Democracy is not a mere system of mild or popular punishments. Real democracy makes demands upon our subject matter from the angles of selection, organization, plans of attack, execution of the plans,

judgment of the results, reorganization in the light of what has been learned, equitable enjoyment of the fruits of the work, and chance for personal growth.

Democracy is not absolute equality of opportunity, for that is impossible. Were it so, democracy would be incompatible with individual differences, and either democracy or individual differences would have to disappear. Democracy is equity of opportunity, and since it is the only scheme of social life that really recognizes individual differences as they occur by the law of chance, it must in the end prevail.

> Truth crushed to earth shall rise again,
> The eternal years are hers;
> But error, wounded, writhes in pain,
> And dies amidst his worshipers.—BRYANT

In how many homes is the real head of the house using all of the brains at his or her disposal to solve the problems of the family life? In problem solving, a rich variety of suggestions is a desirable asset. A bright child may, indeed, often speak words of wisdom, which adults should not be too proud to capitalize. Let us have peace with democracy if possible, but let us have democracy!

Method is a necessary correlate of organization and choice of subject matter. All in all, then, how can we have our ideal of grouping, content, and method? The answer is some modification of the project system of education.

In such a system the individual with all his differences from the others of his group can be "attuned" with a project commensurate with his abilities. He can have the psychological benefits of the unity of the task. He can feel the full force of democracy in every phase of the task. He will escape the harshness of much of the present system which so often results in setting up defense mechanisms to excuse failures.

As intimated, it has been easier to recognize the existence of individual differences than to provide for them in our schools. Many have thought that such provision would require an entirely different organization from the one most commonly found in our public schools of today. Consequently, the fact that individual

differences do exist and that they have important bearings upon the educative processes has been quite extensively ignored.

The project system of education is nothing new to life. The new thing was the departure in the schools from the project system of working. The very first teaching was, obviously, nothing more than one person who could do a certain thing showing some other person, who was trying to do it how to accomplish the desired end. The first legalized education was the apprenticeship system, which retained the elements of teaching just mentioned. Then came the doctrine of formal discipline which led us so far astray, and from whose influence we are not yet free.

It is time to get back to at least as much naturalism as is found in the so-called life of the world. It is time to make completed units of work, adapted to the individual capacities of our pupils, and then teach them so that these skills and the information therefrom will function smoothly in the whole after-life of the child.

For many years experiments have been going on throughout the country to find better ways of operating a school. From the present vantage point, it seems that many of these schemes which have attracted widespread attention have embodied one or more elements involved in the idea of presenting the work as a definite, natural unity. Among others might be mentioned the Dalton Plan, the Gary System, the Pueblo, Winnetka, Batavia, and Denver plans, the Montessori System, the Project Plan, and the Junior High School. But with the exception of the Junior High School, none of these plans has proved generally satisfactory when transplanted. This fact would indicate that the personal equation of their founders was too nearly indispensable for their success. In other words, they were built around the teachers instead of upon the nature of the child.

Now, if the nature of the child is kept constantly in mind, practically all work will be organized into complete units. Later, of course, these complete units may be organized into a hierarchy and thus their interrelations be developed. But for the immediate purpose each unit should have a definite end or objective in itself.

This does not mean that the material of the present course of study has to be discarded and something new put in its place. Most of the material found in our standard text books can be organized upon the basis of child nature and presented as purposeful units of work.

In one school where these principles are practiced, the pupils are given definite individual projects in every branch of their study. To give one of the possible illustrations, each pupil is assigned a separate project in drawing. Usually it has a timely interest for the pupil. The task is then thoroughly done, not as a competitive piece of work, nor yet as a demonstration, but as a real, worth-while, personally interesting job. When the drawing is finished, it is put in a bound collection with those of the other pupils done during that month and put upon the shelf for future reference. When visitors come, the proper committee of pupils escorts them about the room and shows the current work. These children are able to discourse, converse is better, on the work done. They understand the system under which they work, the organization of their tasks, the methods of judging the product, and the purposes of the work done. They seem to be willing to work for the sheer joy of accomplishment.

These pupils are learning all that they would learn under a more martial system where they would do uniform exercises; and, in addition, they are learning the connectedness of their work one part with another. Furthermore, they are learning to apply their work. For instance, the importance of the use of their vocabulary and the application of their language lessons in conducting visitors about cannot be overestimated. Learning, to them, is no end in itself but a very valuable means to a highly desirable end. Each one's work is a personal, not a class, matter and thereby provides for individual differences, yet the attendant social values are far beyond what could be realized under a mass-recitation procedure.

Problems and Exercises

1. In a class in beginning plane geometry there is a rather sharp line of cleavage between two distinct groups, one of which seems to have no particular difficulty with the subject, while the other is exceedingly slow. Suggest a program to be used by the teacher which would make provision for this difference.

2. A teacher of English grammar tried a modification of the Dalton Plan by giving "contracts" to her students who worked them out in writing at their own rate. A text book was used in the course which was designed for this particular purpose. Two problems arose by this treatment. (*a*) The teacher provided for no social features and (*b*) some of the brighter students finished the course in about half the allotted time. Problem (*b*) was serious from an administrative point of view as the State Department of Education requires that each student must have five recitations per week for thirty-eight weeks. How would you proceed to solve these problems?

3. Discuss environment as compared to heredity in effect upon education.

4. Discuss the importance of the fact that very little, if any, negative correlation is formed in the ability of children to do work in different school subjects.

5. Discuss the claim that units of work should be commensurable with the pupils' native traits.

6. An eighth-grade teacher carefully divided her class into three groups, namely, slow, average, and accelerated. The grouping was determined by use of intelligence tests. The students in the slow and average groups were dubbed by those in the accelerated group "dumb-bells." What would be the cause of such a condition and how could it be prevented.

7. In theory, it is correct for a teacher to distribute her time equitably among the students, giving none more attention than others. An elementary algebra teacher reports the case of a boy of "average" intelligence who is "slow." What provision could this teacher make for this student without addressing an amount of attention to him which would be unfair to the rest?

8. A sixth-grade teacher attempted to motivate the study of fractions by conducting weekly open competitions among all members of the class. At first it worked well, and a spirited contest resulted. But soon it was noticed that the real contest was among two or three of the recognized brightest members of the class. On the other extreme were found a few who were invariably the lowest of the group. Discuss the advisability of using such a device. What are its dangers?

9. Discuss the merits of the several plans cited in this chapter as instances where attempts have been made to provide for individual differences in ability to do school work.

10. What advantages are to be secured by having a school room organized as a social group?

References for Further Study

Bode, Boyd H., "Modern Educational Theories," Chap. VII, The Macmillan Company, 1927.

Bolton, Frederick E., "Principles of Education," Chap. XII, Charles Scribner's Sons, 1910.

Douglass, Harl R., "Modern Methods in High School Teaching," Chap. XV, Houghton, Mifflin Company, 1926.

Gates, Arthur I., "Psychology for Students of Education," Chap. XVII, The Macmillan Company, 1924.

GEYER, D. L., "References on the Problem—Project Method," *Chicago School Jour.*, pp. 18–19, September, 1919.

MONROE, WALTER S., "Directing Learning in the High School," Chap. XII, Doubleday, Page & Co., 1927.

MORT, PAUL R., "The Individual Pupil," American Book Company, 1928.

ODELL, C. W., "An Annotated Bibliography Dealing with the Classification and Instruction of Pupils to Provide for Individual Differences," Univ. Illinois, *Bull.* 12, Vol. 21; Bur. Educational Research, *Bull.* 16, 1923.

PARKER, S. C., "Methods of Teaching in High School, Chap. XV, Ginn & Company, 1920.

SKINNER, C. E., I. M. GAST, and H. C. SKINNER, "Readings in Educational Psychology," Chap. VI, D. Appleton & Company, 1926.

STEVENSON, J. A., "The Project Method of Teaching," The Macmillan Company, 1921.

STRAYER, GEORGE D., and N. L. ENGLEHARDT, "The Classroom Teacher," Chap. IV, American Book Company, 1920.

STRAYER, GEORGE D. and NAOMI NORSWORTHY, "How to Teach," Chap. X, The Macmillan Company.

THAYER, V. T., "The Passing of the Recitation," Chaps. 13, 14, D. C. Heath & Company, 1928.

THORNDIKE, EDWARD L., "Educational Psychology," Vol. III, Part II, Bureau of Publications, Teachers College, Columbia University, 1913.

VOEGELEIN, L. BELLE, "Adapting the Schools to Individual Differences," Twenty-fourth Yearbook of the National Society for the Study of Education, Part II, Public School Publishing Company, 1925.

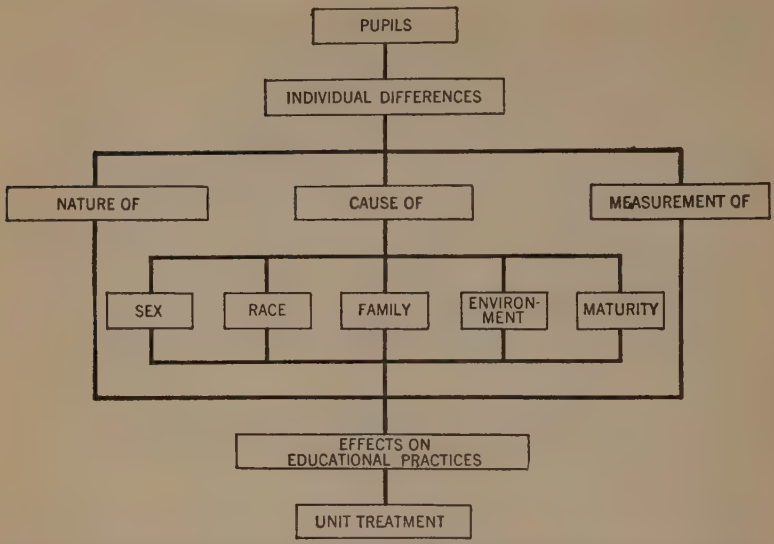

Fig. 11.—Graphical representation of the content of the chapter, Individual Differences and Their Educational Implications.

Chapter VII

SOCIAL CONTROL

I. CONTROL FORCES OPERATING IN LIFE

Our social order moves forward with increasing regularity. Society in the aggregate and indeed each unit of our social system large or small are examples of orderliness. More and more respect for the individual, his rights, and prerogatives, is being closely woven into our social fabric. Today we do not find a wholesale trampling down of the weaker by the stronger, for proper safeguards are thrown around those needing protection. People have learned to live together in groups, each enjoying his full measure of life's fruition. Should an individual reach out and grasp more than is his just due, swiftly and furiously social counterreactions take place, which reestablish the temporarily unstabilized social equilibrium.

An analysis of the reasons for orderly and cooperative behavior reveals interesting and significant types of control. There are many sorts of forces which check and balance the social reactions of all in our social order. They are selective in their application; the individual's degree of socialization determines which of these forces will have the greatest influence. It is obviously impossible to make an exhaustive analysis of control forces in a book such as this. Only those which seem to have the greatest bearing upon our specific problems will be considered.

There are those individuals whose social reactions are controlled mainly through force or the constant threat of force. They are a constant prospective menace to society. They represent the lowest stratum of our social order, for force is the least elevated of all control appeals. To this group belong our criminals, moral degenerates, and our other social outcasts. Perhaps the next lowest in the scale of socialization are those whose conduct is most influenced by ridicule and social disap-

proval in general. This class modifies its activities primarily on the basis of escaping such disapprobation. Force is unnecessary for there exists some little social sensitiveness. However, the appeal is negative. To a third class belong those who are impelled to cooperative living by the desire for social approval. They react correctly to the social stimuli because of the lure of social approbation. This group gives evidence of more highly developed social qualities than the one just mentioned, for the appeal is of a positive nature. Still another classification is that group of individuals who are socially cooperative because their training leads to such conduct. They have developed the skills of proper social reactions but without an adequate understanding of its significance. The individuals of this class are not concerned with social approval, disapproval, force, or ridicule. They have been trained in the ways of reacting socially in much the same way as the average person learns to operate an automobile. He acquires all of the necessary coordinations for successful performance but understands little, if any, of the mechanical processes these coordinations are designed to effect. Reason is another force by means of which some individuals are able to weigh the evidence for or against a certain reaction and choose the one most appropriate. Lastly comes the force of education. This is indeed the highest and most desirable type, and those whose actions are controlled by it have the skills of cooperative living, but in addition to this they have the knowledge of why such living is most desirable. This class, to use the above analogy, may be likened to those who have learned all the skills to the successful operation of a car but who, in addition, understand the effect each of these skills has in its mechanical control.

The forces controlling social behavior are perfectly natural and are not in the least artificial or man made. Like all other natural forces, however, they may be man controlled. That is, he may or may not make use of them as he sees fit. Thus any force or group of forces may operate naturally or be made to operate artificially. For example, one may make a foolish utterance in a public meeting and as a result be ridiculed for his error. The reaction of the normal individual would be to use greater care in his assertions in the future. This illustrates the natural appli-

cation of the force of ridicule. On the other hand, a person may be the victim of artificial ridicule as were those in colonial days who were placed in the stocks for certain misdemeanors. Such treatment no doubt motivated behavior toward greater socialization, but it was man's application of the control. And so it is with all other forces, they are present for natural application as well as for use by man as the needs arise.

This classification of the forces of social control operating in life is indeed rough and, as was mentioned, no attempt has been made to make it completely exhaustive. Unquestionably there are others that could have been included, but for our purposes those given are sufficient. They have been mentioned in order of increasing desirability from the standpoint of respect for the personality of the one controlled, starting with the lowest, that of force or threat of force and ending with the most highly desirable, that of education. Again, this order is indeed debatable and it is not our purpose to offer a defense for it for space will not permit. It is also true that no individual is controlled by one force alone, but rather by a complex of many, each operating with varying degrees of influence under varying conditions.

1. The Conjectural Scale of Controlling Forces.—It will be illuminating to try to place these controlling forces on a scale indicating the relative weight of influence each plays in life. Although there is not and perhaps never will be any objective data to substantiate any such a statistical device, we are going to make the attempt on the basis of reasonable conjecture. Such a scale would, undoubtedly, follow closely along the lines of a normal distribution curve, for it is reasonable to believe that we would have the same spread in socialization that we have in other traits.

On this basis we could conclude that a very small proportion of our social reactions, perhaps not more than 1 to 5 per cent at the most, are influenced to the greatest degree by the force of education. It would be our guess that a maximum of from 15 to 20 per cent are influenced by reason and training, making a total of approximately from 15 to 25 per cent for the three higher types of control. It is also reasonable to conclude that

social approval and disapproval have the strongest influence of all, and thus we would estimate that these are the forces determining our social relationships to the extent of approximately 55 to 70 per cent of all cases.

As we approach the lower end of the scale we find a falling off of the influence of the forces so located, as they are negative in their nature and more direct in their application. It would be a rash assumption, and indeed an unfounded slur on our social order, if we classed them among those operating as controls for the greater proportion of our activities. On this basis we can only conclude that they function in perhaps approximately 15 to 25 per cent of the cases, with not more than from 1 to 5 per cent being influenced by force or the threat of force. Force is barbaric in its nature and in our present state of civilization, would influence only the smallest percentage of our social contacts.

2. Direct and Indirect Control.—Placing these forces on such a scale helps to make more discernible another helpful distinction. It will be noted that as we approach the upper end of the curve, with education as its limit, the need for the use of direct social pressures becomes increasingly remote. Acts of individuals which are controlled by the higher forces are naturally highly socialistic because they involve no fear and because of the cooperative nature of the functions involved. No coercion is needed as these activities are controlled from within because of their greatly developed social qualities. This indirect control is most desirable in civic life, and there should be an increasing tendency to move toward the upper end of the scale in the application of these controls.

The cases at the lower end of the scale are the forces which control the acts of individuals which grow out of selfish ambitions or interests. Such acts are infringements which often become license, individualistic and antisocial responses despite all the safeguards society has established. These activities are in the lowest stratum of social relationships and their operation must be circumscribed. It may be harsh to say, but such antisocial activities are barbaric in their nature and their direction must be

ordered by lower and more direct appeals. At one time, in the early development of our civilization, direct unrelenting force was the only effective agency operative in the control of the individual's actions. Even today, in some cases, we find that society must exert most direct and severe pressure to effect even the crudest type of cooperative living. Yes, in our most extreme cases, we must resort to measures of control that are actually cruel in their nature.

There seems to be a concomitant variability between direct and indirect control. As we progress from the lower end of the scale upward, the emphasis varies progressively from direct to indirect control, the need for coercive methods slowly fades out, and in its place we find a corresponding strengthening of indirect control. When we finally reach the upper end, this indirect control is definitely established and the necessity for direct control has completely disappeared.

According to the arrangement of our scale, we find that social approval and disapproval seem to be the forces influencing the greatest number of our activities. Whether these controls should be classed as direct or indirect is problematical. They are perhaps neither but, rather, a combination of both. Although we have said the tendency should be toward the upper end of the scale, such progress will proceed slowly and will require much more emphasis on socialization than we have placed upon it in the schools in the past.

II. SOCIAL FORCES OF CONTROL AND THE SCHOOL

1. The School as a Social Unit.—Despite all absurd barriers thrown around the children in some schools, which tend to establish artificial responses non-social in nature, the fact remains that the school is a social institution. It is composed of boys and girls who are social beings imbued with the ideals of cooperative living. These individuals are grouped together in social contact and when beings are thus brought together, we have the set-up of a social institution.

Thus, inevitably, those forces of control which are in operation in life outside of school must be present in the classroom. They

cannot be denied although we can and perhaps do ignore them. The teacher can submerge them and push them out of influence, but as soon as that unnatural pressure is removed they rise again and assert their controlling power.

To stumble blindly on, planning a program of classroom control which ignores natural forces must, necessarily, be ineffective and laborious. To use force on one who possesses highly developed social qualities, and whose strongest appeals are of the desirable types, is not only wasteful but is equally harmful in its effects. On the other hand, the attempt to control those low in the scale of socialization by purely indirect measures is equally ineffective. Teachers must understand the great variety of forces available for their use and adapt them to the varying needs of their students.

It is true that, perhaps more often than not, teachers fall into the habit of using one method of control to the exclusion of all others. Significant is the fact that this method is usually one of the lower and less desirable forms. With but little search, classrooms can be found in almost any school system which are controlled solely by the use of force or the threat of force. When such a condition exists, boys and girls are coerced into submissive behavior. Force thus becomes the stimulus for social reactions and through exercise this bond becomes firmly established. They learn to respond to direct control but receive no training in the use of higher appeals as stimuli. This tends to result in social maladjustment.

III. OBJECTIVES OF SOCIAL CONTROL IN THE CLASSROOM

We have discussed, at some length, the varieties of control forces operating in life outside of school in order that we may understand how they function in this larger social order. Our task is to establish the same type of control in the classroom. Any other program must necessarily be artificial and work against natural tendencies. Well-ordered cooperative living must be learned. Definite bonds for social reactions must be established. Thus, to teach students to be socially efficient, we must produce the stimuli for it in the classroom. We cannot demand correct reactions of any sort unless we set up the situations which result

in them. Hence, our problem is primarily that of evolving the correct social situations and then directing the boys and girls to make the desirable responses to these stimuli.

1. Social Control Prepares for Cooperative Living.—That children must take their places in society is axiomatic. They must be able to live and work amicably with their fellows. This means, of course, that they must learn to inhibit selfish desires which retard group progress and militate against the rights and privileges of others. Those who have not learned these proper reactions are unsocial, and they menace the well being of the group to which they belong. Any unsocial act in society upsets its equilibrium.

Cooperative living as an objective should thus be our major interest in the development of social control. Good "discipline," which teachers so often directly seek, is but a by-product of correct social control and is not of primary value. Unquestionably, a classroom must be orderly and so organized that the proper setting is established to facilitate the performance of mental activities. But our idea of social control is vastly more far reaching than "good order." Any teacher can secure this "good order" if she sets out to get it by direct means, but she will do so at the sacrifice of all of the other advantages of real social control. The teacher who decides, however, to establish scientific social control is, in addition to the accomplishment of an orderly environment for work, setting up learning situations of the proper sort. Under such control, boys and girls will not be "orderly" because they fear the lash of a martinet but rather because part of their own program includes the establishment of ideal working conditions to protect group progress. Group consciousness is so strong that undesirable responses become the rare and decidedly unpopular exception.

2. Social Control Provides for Active Industry.—Idleness in any setting of work indicates a lapse in social control. The idle child is a non-producer and, when work is the order of the day, even momentary idleness is the expression of an unsocial tendency. When the class as a unit fails to work industriously toward

the accomplishment of defined tasks, social control ceases to function. There is no value in setting up the machinery of social control if it is permitted to remain dormant. It must be in constant operation, forging ahead toward the accomplishment of worthy ends.

IV. METHODS OF ESTABLISHING INDIRECT CONTROL

It has been said that the emphasis should always be in the direction of indirect control. Bagley says, "It is a paradox of the well disciplined school that 'discipline' is conspicuous by its absence."[1] But it must not be understood that indirect control alone will suffice for all types of students. We must keep in mind the fact that a relatively small percentage of individuals can be controlled by an indirect method alone. There are some, as has been stated, who can be appealed to only by the lower forces.

For our purposes, we shall assume that indirect control is that type the measures of which are not in evidence, and the results of which leave no unsatisfactory attitudes on the part of the pupils. As will be mentioned later in this chapter, a teacher may, through fear, control students in such a manner that he may need never mention or give any indication of his control measures. But such a teacher may set up attitudes in the children which are dangerous. Both elements of the above definition of indirect control are necessary to determine a suitable classroom procedure.

An analysis of each child to determine the types of appeal by which he or she is most influenced at a given time should be one of the first duties of the teacher with a new class. This gives him an understanding of the methods to pursue in each case. He should then establish a general type of indirect control for the class as a whole, but treat each individual according to his needs as the occasions arise. A good policy is to take it for granted that the class may be controlled by indirect measures and not to depart from this procedure except in the cases of those students needing individual treatment. The teacher should try to

[1] Bagley, W. C., "School Discipline," p. 1. Quoted by permission of The Macmillan Company, publishers.

develop students into what they ought to become, but he must remember that he is to take them as they are. The teacher who thinks he can always resort to indirect control alone is due for a disillusionment.

1. The Development of a Group Consciousness.—A feeling of group consciousness comes through a gradual process of development and does not spring up spontaneously. Children throughout the grades and high school have a strong group loyalty. This is a most desirable trait and can be made to operate as a regulating device for the control of student relationships. It is true, of course, that like any force it may, at times, have undesirable manifestations as in the case of the rebellion of the group against constituted school authority. But, perhaps more often than not, such undesirable conduct is instigated by bad management.

By capitalizing group loyalty the teacher may develop a school or class spirit which leads to the achievement of a high type of morale. Once the seed of group consciousness is sown, it needs but little cultivating to bring forth the fruit of correct social relationships. All of the materials for the construction of a closely knit cooperating body lie dormant in the group, and it is but necessary for the teacher to take these elements and evaluate and organize them to make them function in the attainment of specific social outcomes. Some suggestions on how this may be accomplished are in order.

a. Concerted Action on Group Project.—When groups of individuals unite to accomplish some project demanding the concerted action of all, the "we spirit" slowly, but forcefully, establishes itself. When such a spirit develops, through the group consciousness and pride, the individual submerges his own interests and desires in favor of the advancement of the class. Thus, any devices which tend to weld the class together into a well-coordinated whole, working toward worthy class goals, result in a highly developed state of group consciousness.

One grade school attempted to effect this type of group consciousness by establishing certain ideals which required the cooperation of each child. Some of the objectives set were:

"One hundred per cent attendance each week," "No defacement of school property in this class," "One hundred per cent politeness in our group," "A steady average improvement of school work each week," "Absolute cooperation in matters of school policy," "Our room the cleanest and most orderly in the school," "Every member of the class a producer."

These are only representative of a great mass of class slogans which may be used to define group standards, for the possibilities of setting such objectives are indeed limitless, as almost any number can be established. It is to be noted that the emphasis is placed on concerted activity which stresses cooperative endeavor. Care should be exercised to limit the use of such standards for when placed on a wholesale basis the effectiveness soon diminishes. Skill is needed in the operation of such a device as is the case in any other teaching agency one may use.

It is more effective to enlist the aid of the students in the formulation of class objectives, or other group projects, than to superimpose them. A skillful teacher, when the necessity for the improvement of a certain type of social reaction arises, can tactfully discuss with the children the advisability of adopting and working for the attainment of such an objective. Some teachers accomplish this by having the students appoint a committee to establish an objective to fit the need. By so doing, the members of the class feel that they have had some authority in the administration of their own group activities and thus feel more directly responsible for the results. No stronger appeal than this can be made for it has back of it the force of a great social pressure. But, also, in addition it is psychologically sound for the students have attained a state of readiness for performance, for individuals cannot voluntarily pledge themselves to activity without an enlivening of the synaptic connections controlling these activities.

b. Individual Responsibility for Group Progress.—A second device which teachers may use in the development of a group consciousness is to make each child feel his full measure of responsibility for the progress of the class. Again we must avoid foisting this upon them, but rather we should tactfully lead them to see the immense value and satisfaction of such a

cooperative relationship. Reports of individual investigation to the class are helpful in the accomplishment of this. The performance of such an act places the reporting student in the position of contributing material definitely leading to the advancement of his fellows. It is well for the teacher to emphasize the service this student has rendered the group. Because of the appeal of social service which lies latent in all normal beings, intense satisfaction follows the successful completion of such activity. Thus according to the law of effect, there is established a tendency to repeat this or similar services which helps lay the foundation for a habit of cooperative living.

The skillful teacher will find her classroom the source of many opportunities for this type of social activity. Various uses of the monitorial system, class committee work, the holding of class offices in an organized group, and the like offer an abundance of situations where individuals may contribute to the progress of the group. The responsibility placed upon those performing group service highly motivates it and adds a strong appeal. It draws the students closer together into a more firmly united working unit.

c. Development of Class Pride.—The evolution of class pride is another method of arousing a group consciousness. Personal satisfaction, as we know, follows the successful completion of a worthy task performed by the individual. The law of effect is diminished little, if any, in its application to the effective termination of a group activity, for, in such, each one plays his part in its accomplishment. If the emphasis is properly placed, the public opinion in the class can be so controlled that lack of cooperative endeavor is decidedly unpopular. One main difference between schools or classrooms that have a highly developed social control and those that do not, is that in the former public opinion frowns upon anti-social responses where in the latter they are popularized.

A case in point is that of a group which, of its own accord, had set out to cooperate in every way with the regulations of the school. This class, during the course of the year, caused no little favorable comment because of their whole-hearted support of administrative edicts. One day, however, one of the group momentarily forgetting himself, started a siege of snowballing on the school grounds, a practice which had been forbidden. The

case was considered by the authorities and the child was duly punished. The class was highly indignant, for this fellow had "spoiled their record." In addition to the punishment already received from those in authority, some of his classmates took it upon themselves to register their own disapproval, which was accomplished in a most emphatic manner.

Social pressure of this sort is tremendously strong and decidedly effective. In fact it is dangerous in its scope, and must be kept well in control for there is a possibility that it may become excessive. Here again the skill of the teacher is demanded, for school spirit may become a faithful, never-failing ally if judiciously used, but on the other hand it may become a real menace if applied without reasonable safeguards.

2. The Influence of a Challenging Job.—Idleness in the classroom is a prolific cause for anti-social responses. It is natural for children to be active and unless this activity is directed toward purposeful ends it may lead to unworthy pursuits. An active interest in the performance of tasks causes students to concentrate on worthy pursuits. No teacher need worry about the "discipline" of a child who is always busily engaged in productive endeavors. Such individuals are "too busy" to be bothering their neighbors. It is those who have "nothing to do" that cause trouble and are recalcitrant.

The teacher is of the greatest influence in stimulating an active interest in work. If his methods are effective, he will be able to make school work so vital and consuming that his students cannot fail to be enthusiastically engaged in its prosecution. A dull, lifeless teacher usually has difficulty in arousing students to the point of active interest in productive school work. When vital interest is lost, school activities soon become distasteful and irksome and such a condition leads directly to "disorder." Enthusiasm and energy are contagious and the teacher should attempt to radiate such qualities. Few, if any, teachers can fire students to the point of vigorous work if they themselves perform in a half-hearted and spiritless manner. "The world steps aside to let a man pass who knows where he is going." The teacher should think of the conduct of his recitation in terms of this quotation.

3. **Personality Elements of the Teacher.**—No attempt will be made to define the term "personality" for it is one upon whose definition no two authorities agree. What we shall do, however, is to select some of those elements which are recognized as contributing to the teacher's personality and discuss them from the point of view of their place in the establishment of indirect control.

Perhaps some might feel that personality elements should be placed under the heading of direct control, for many teachers are so constituted that children fear to make unapproved responses. Such a pugnacious attitude would unquestionably be most direct. Also, there are other personality elements that might be named which could as readily be classed under the heading of direct control but it is not our purpose, at this time, to consider such phases of the teacher's make-up. On the other hand, the discussion will be limited to those elements only which tend to control through the establishment of desirable appeals and which leave no residue of deleterious effects.

a. Assumption of Good Control.—Successful teachers quite generally feel that, other things being equal, we get quite largely what we expect from children. The teacher who enters the room dodging as though she were expecting to be hit with a piece of chalk, in time, may not be disappointed. Or if a teacher begins the day with "a chip on her shoulder," she is quite likely to find one courageous enough to knock it off. Children are very sensitive to attitudes which offer cues for their behavior.

If, on the other hand, the teacher takes her class for face value, and assumes that the students' behavior will be satisfactory, such an attitude is a potent force in its accomplishment. Even though there be those present who have tendencies toward unruliness, the assumption of a spirit of cooperation on the part of the teacher makes it infinitely harder for these individuals to practice their undesirable activities. Most people like to be credited with the possession of qualities most expedient, even though down in their hearts they know they are not worthy of the confidence thus placed. Such trust would give students an incentive to strive for the higher standards that the teacher takes for granted are present. It is but natural to try to live up to the faith that someone places in us.

In this same connection might come the question of the teacher's assurance. The weak, vacillating, uncertain teacher is a strong stimulus for disorder. Students have little respect for one who cannot make decisions or who in any way indicates a weakness of purpose. There are many matters of policy arising daily that require discriminating judgment, which the teacher must adequately meet. It is better for him to treat these decisively than to stand helplessly before the class wondering what to do. Such rapidity in arriving at his decisions may lead to erroneous illations at times, but these can be corrected with less harm than is wrought by the impressions caused by wavering indecision. The teacher does well to appear at all times the master of each situation, for by so doing he will inspire confidence.

b. Fair Play and Justice.—We expect students to play fair with their fellows and the teacher by way of example must not do less. It is difficult for a teacher to impart fairness to his pupils if he himself is obviously unjust in his treatment of them. Fair play on his part is a puissant force in their control. Distrust breaks down confidence, and when this faith is lost the teacher's position of leadership becomes highly unstable. So long as the student feels assured of never-failing justice under all circumstances, his spirit of cooperation is manifoldly increased.

Boys and girls have a keen perception of fairness. They quickly detect irregularities and despise them wholeheartedly. Several years ago the writer walked home from school with a seventh grade boy who was known to be somewhat troublesome. In response to being asked how school progressed this particular day, Bobbie remarked, "Well not so good. I got in a jam with Miss B. and she trimmed me. But just the same she is a square shooter—even if she has a mean wallop." "A square shooter," what a tribute to that teacher! Incidentally this "square shooter" was one of the strongest teachers in social control the writer has observed. Part of her great strength was due to her persistently fair methods of control.

c. Good Cheer.—A cheerful, smiling teacher can more easily enlist the cooperation of the group than can one who is sour and disgruntled. The qualities of good cheer and pessimism are

both radiant and one can be reflected to the class as well as the other. Hence it is wise for the teacher to make an effort always to radiate good cheer. But there are times, to be sure, when it is difficult to be in high spirits. We must remember, however, that it is perhaps more taxing to cope with the destructive effects upon a class which have been stimulated by pessimism than to assume an attitude of buoyancy.

V. CAUSES FOR BREAKING DOWN OF SOCIAL CONTROL

No teacher can hope to control his class completely through indirect means alone, for there are times when, in the face of greatest efficiency, unsocial tendencies will creep in. True, a teacher can do much toward providing the right sort of classroom environment which actively functions in its control, but the fact remains that the emotional attitudes of the children are not wholly within his power to direct. Infractions may be stimulated by extra-school conditions, over which the teacher has no control and about which he may know nothing. Thus, an occasional outbreak is not necessarily an alarming indication nor does it indicate failure on the part of the teacher, provided that he has done all within his power to preclude any such activities. Part of the teacher's equipment for the establishment of indirect control must be a knowledge of the causes for its breaking down. With such a knowledge the teacher can take measures to prevent the development of these various stimuli.

1. Uncontrolled Temper.—Any person who flies into a fit of temper is an interesting spectacle to the cool, well-poised observer. An angry person will often make wild, meaningless, even ludicrous gesticulations, say foolish, thoughtless things, and, in general, stage quite a performance for those having a sense of humor. There are some boys and girls who enjoy nothing more than to see a teacher under such emotional stress. In almost every class there will be at least one who is willing to risk the danger of punishment in order that the group may be entertained. Hence, should a teacher engage in an anger "tantrum" he is most probably offering a real stimulus for disorder.

2. **Tactlessness.**—"Tact is primarily a way of getting maximum results with minimum friction."[1] Some teachers make requests which result in antagonism, while others may make the same requests and secure immediate cooperation. It is not so much what one says that causes trouble but how one says it. A dean of a certain college, known to the writer, is so tactful that when he dismisses one of his students for inefficiency it is not uncommon for the student to feel that a great favor has been conferred upon him, so "painless" is the method. Teachers should always project themselves into the student's position to get his point of view and then treat him with due regard for that point of view. A rankling request arouses undesirable responses but a request "painlessly" made stimulates good will and cooperation.

3. **Teacher's Voice.**—The voice is a valuable instrument of control. Its skillful use on the lecture platform is a potent force in the swaying of audiences and the same power may be used in the classroom. A low, well-pitched voice is soothing, while one that is high pitched and strident is irritating. A monotone is an irritant while careful modulation carries force. We cannot all have melodious voices but we can, with some tone culture and practice, learn to use what voice we have to its best advantage as a control force.

4. **Courting Popularity.**—Some teachers foolishly set out to become socially popular with the students, which is nearly always done at the cost of self-respect. Recognition of professional worth is the only worthy type of popularity, for it comes naturally and as a reward of outstanding work. But when a teacher sets out to "take the school by storm;" to have all at his feet, he must do so at the expense of ideals infinitely more important. The teacher who courts social popularity with his students at once sows the seeds of disrespect, for sooner or later they see through his game. It is indeed true that teachers may, and it is to be hoped often will, have qualities which lead to a genuine

[1] Bennett, H. E., "School Efficiency," p. 365.

fondness on the part of the students, but let this develop normally and not as the result of a campaign.

5. **Lack of Uniform Requirements.**—If shooting paper wads in class by Billie Smith today is wrong, it is wrong for Mary Brown to do it under the same conditions tomorrow. But many teachers do not realize that censuring one day for some act and failure to censure at some other time for the same act is a prolific cause of infractions. We must clearly make up our minds what we will and will not tolerate, and then see to it that adequate treatment of all irregularities invariably follows. Students are generally cooperative; they are quite ready to do as desired, but if there is no well-established policy they are at a loss to know what is and what is not the approved type of behavior.

VI. USES OF DIRECT CONTROL

The meaning that is to be attached to direct control is the use of the more coercive forces in the case of those individuals who have failed to respond to the higher social appeals. While indirect control is an internal correlative of behavior, direct control is external and has less natural relation to the cause of the behavior. Its use is for follow-up purposes and it is to be resorted to only in case of apparent failure of the higher forces. It has been mentioned that the policy is to assume a high state of socialization but with the firm realization that in actual practice it does not so uniformly exist. Those cases to which the assumption does not apply will soon make themselves known, and it is then time enough to resort to lower appeals in such cases when the needs arise.

It takes great skill to administer direct control, for the policy to be pursued depends upon the individual's degree of socialization. A careful study of the individual differences in the class must be made, as has been mentioned, which involves the ability to make an adequate pupil analysis, a skill that comes only through years of careful observation.

To treat an individual as his needs dictate brings up a much-mooted question. Is it legitimate to use ridicule, sarcasm, or

threats? Our position will be that in certain extreme cases and under properly controlled conditions, yes. They are, of course, among the lowest types of forces but occasionally we find individuals whose social development is so low that they cannot be reached in any other way. Such students must be reduced to a state of submission where, at least, they will not block progress. But such withering forces must always be used in private. It is a delicate task to use sarcasm and ridicule in the classroom because it cheapens the child's self-respect in the eyes of his or her comrades. Also, a threat must never be made unless the teacher is in a position to see it through in the event that the pupil "calls his bluff."

VII. PUNISHMENT MUST FOLLOW FLAGRANT WRONGDOING

As in the larger social order the offender is punished for committing a misdemeanor, so in school pupils must be punished for unsocial acts. This punishment, although it is administered by the teacher, should represent the disapproval of the class for disloyalty to the group spirit. Retribution is not the aim and never should be, but rather punishment must be made the natural, logical, and certain effect following undesirable responses.

Another function of punishment is to attach to the offense an element of displeasure which, according to the law of effect, will be a deterrent to its repetition. Definite avoidance of undesirable activities will thus be learned.

1. Teacher's Attitude toward Offense.—Regardless of the nature of the offense, it is always wise for the teacher to assume an absolutely objective attitude toward it. He should conceive himself to be the chief official in his classroom and, as such, the authoritative agent for that social group. When punishment becomes necessary, theoretically, it is administered because the group expects it rather than because it gives the teacher personal satisfaction to inflict it. This attitude brings to bear a tremendous social pressure. Further than this, it removes much of the pleasure in wrongdoing, for there are indeed those students whose great ambition it is to hurt the teacher. If he, however, main-

tains an impersonal attitude toward it, it removes much joy from the act and thus a common cause for its practice.

VIII. PRINCIPLES OF ADMINISTERING PUNISHMENT

1. **Punish in Private.**—To punish a child before the class has three distinct disadvantages. In the first place, it breaks down a child's self-respect. We must be ever on the alert to develop self-respect in children for when this is once destroyed a most valuable character-building ally is lost. Individuals who have little or no self-respect are usually a menace to social cohesion. In the second place, we have those individuals who perform for the entertainment of their fellows and who derive sincere satisfaction from martyring themselves for the "benefit of the class." Thus, to punish such an individual before the rest is to give him rare pleasure in spite of the pain that might result. In the third place, public punishment may result in the antagonism of the entire group; for such a strong bond of loyalty exists among boys and girls that, upon seeing one of their number punished, it may militate against the teacher.

2. **Punishment Must Inflict Pain.**—Punitive measures are of no value unless they are made either physically or mentally painful, otherwise they are merely farcical. A case in point is that of a young school principal who spanked a second grade boy for some misdeed but he apparently failed to make a sufficient impression for the little fellow soon after boasted that it "didn't hurt a bit." Punishment of this sort is not only useless but exceedingly harmful, for students soon learn that the pleasures of disorderly conduct can be secured with but little cost in dolor. Without doubt this child felt that if his punishment was the "best" this principal could offer, it would not be too hazardous to repeat the offense.

3. **Punishment Should Follow Offense as Quickly as Possible.** It would be psychologically ideal to have the punishment follow the offense instantly for in this way the law of effect will best operate. The direct and instantaneous association between the

misconduct and the punishment is desirable for it assists in the formation of a strong bond which has a deterrent effect. Thus, the longer the expiration of time the less effective will be the measures used. It is, however, not always possible immediately to administer punishment, and a safe rule to follow is to administer it as quickly after the offense as is practicable.

4. **Punishment Should Be Certain.**—Wide-awake youngsters get a great thrill out of taking chances. If there is the slightest opportunity of accomplishing some undesirable act, without punishment, the chance element present makes the doing sweeter. If children are made to realize, however, that all the possibilities of gambling have been removed and that punishment will inevitably follow, such knowledge performs a preventive function.

5. **Punishment Should Be Adjusted to Fit Offense.**—There are some teachers who have a stock punishment for every offense. A case in point is that of the teacher who made excessive use of keeping children after school. If a child whispered, shot a paper wad, "skipped school," was insolent, or what not, the punishment was "one hour after school." This erroneously places all unsocial acts on the same plane; the distinction between major and minor offenses is not made. Again, excessive use of one form of punishment robs it of its effectiveness.

6. **Punishment Should Be Adjusted to Offender.**—Likewise the temperament, sex, age, and motive of the individual must be carefully considered and weighed before punishment is administered. Some students are so constituted that they require more than others to accomplish the purpose. There are those who will be crushed by a cross look while there are others who will "take" the severest a teacher has to offer with a smile and apparent amusement. No stock punishments for specific offenses should be predetermined for such practice eliminates the possibility of adjustment to the individual.

7. **Do Not Punish When Angry.**—If a teacher punishes when he is angry he is likely to be unduly severe and perhaps cruel.

Of course, a teacher should always strive not to lose his temper, but there are times when self-control may be almost, if not entirely, impossible. Under such conditions, it is best to wait until this emotional stress has disappeared; for when he is aroused in this way, his judgment and general efficiency are at a low ebb. He will do and say things which he would never think of doing and saying when in full control of his faculties.

IX. SOME PENALTIES OFTEN USED

1. **Removing of Stimulus.**—Often the environmental conditions of the classroom offer stimuli for disorder. These distracting factors are more attractive than the regular work of the day. If such a condition is encountered, perhaps the first step would be to remove these distractions. For example, if two friends cannot be seated close together without disturbance, their separation removes the cause for the trouble. In a sense this is more preventive than punitive, but in another sense it may be considered under either heading.

2. **Loss of Privileges.**—Closely allied to "removing the stimulus," but somewhat different in its scope, is the method of removing privileges. A school privilege is indeed precious to a child and to be deprived of it is really painful. It is thus very effective to have these privileges come as a reward for merit of one sort or another and not the common right of all.

3. **Excessive Repetition of Act in Private.**—The writer happened in a classroom just in time to see a boy standing in one corner of the room throwing tiny paper wads with all his might. Upon closer observation it was noticed that he had a shoe box cover quite full of these wads of paper each rolled into a ball. Later the teacher reported that she had required the rolling, counting, throwing, picking up, and again counting (to make sure all were removed from the floor) of five hundred such wads, the size of each of which was not to exceed that of a pea.

The child in question had a passion for throwing paper wads in class and, as in the case of most mischievous children, he got

pleasure out of performing for the group. However, when he was required to carry on the same practice to great excess and with the social setting changed, he became tremendously tired of the process. This type of punishment is effective if used not too frequently.

4. **Retaining after School.**—The advisability of keeping pupils after school is questionable. We are attempting to develop in the students an interest in school so that keeping them after school as a punishment is to work at cross-purposes with our aim. In the last analysis, however, the teacher must be the judge as to whether or not he should use it for there may be times when it would be effective. If he feels that it can work no harm and it seems to be particularly fitting to the case at hand, it might be well to try it.

5. **Assigning School Work.**—Teachers sometimes resort to the old practice of requiring students to do ten algebra examples or read forty pages of some book, or the like, as punishment for some offense. This method is pernicious for it definitely attaches an annoyer to legitimate school work.

6. **Sending Pupil to the Principal.**—Such practice is weakening to the teacher, for the children soon learn that they are too much for him. One should never resort to it unless he finds himself in one of three precarious situations which are: (*a*) when he has done everything within his power but has successively failed, or (*b*) the student is in open defiance and the teacher is powerless to break it, or, (*c*) either he or members of the class are in physical danger. Under any of these three conditions the teacher is warranted to enlist the aid of the head of the school.

7. **Notifying Parents.**—This, too, is a "last resort" measure, but perhaps not to such an extent as sending the pupil to the principal. Excessive and unnecessary use of this method might give the students the impression that the teacher is incapable of controlling them and thus weaken his influence.

8. **Corporal Punishment.**—Rarely if ever should a teacher resort to this type of punishment and if he does use it, it should be under carefully controlled conditions. When its use is "necessary" it is usually a clear indication that the teacher or someone farther back has failed and thus it should be another of those "last resort" measures. Its use is forbidden in some states by law.

There are some conditions to be observed in its administration that teachers might do well to heed. In the first place, he must be sure he is capable of doing a good job. One of the most ludicrous sights the writer ever saw in a classroom was an irate teacher, slight in stature, trying to shake a husky football player of about 200 pounds in weight. The fellow was stationary while the teacher took the shaking. She bobbed back and forth as if some one were shaking her and the fellow took his "punishment" with ill-suppressed merriment.

Another condition to observe is to be sure to have an adult witness, for the report to the parents of what takes place may be greatly exaggerated. Much trouble can come from even perfectly harmless corporal punishment by such exaggeration.

A teacher should never strike the face or any part of the body where a permanent injury may result. Without exception punishment should be so administered that no marks will be left.

Problems and Exercises

1. A first-year, high-school, home-room teacher started the school year off by giving her students a set of regulations to govern their conduct. Criticize this method.

2. A high-school teacher with an excellent reputation reported to her high-school principal that there was a growing tendency toward impertinence in her classes. The students involved were found to be perfectly respectful to the other teachers. Make an analysis of the possible causes for this disrespect and suggest remedies.

3. A large, high-school boy was asked, because of constant disturbance in class, to leave the room. He refused. To avoid further trouble the teacher did not insist on his leaving. The student winked at one of his friends over his victory as the teacher proceeded with the recitation. List the probable causes of such insubordination and suggest how you would handle such a case.

4. A seventh-grade teacher new to a certain school system found that the majority of her class were recalcitrant and, without any apparent cause, would

express unsocial tendencies. They seemed to have no conception of social cooperation and did not hesitate to take advantage of one another or of the teacher. Suggest a program for building up social control in this classroom.

5. In civil life one is required by law, if subpoenaed, to give any incriminating evidence in his possession, for which he is asked, against an individual committing crimes, either felonies or misdemeanors. Discuss the advisability of using a similar practice in the public schools.

6. Give reasons for and against a student's selecting his own punishment for misconduct. What would be your recommendation concerning the use of such a procedure?

7. A student in a certain class placed an alarm clock in the ventilating shaft, which at the proper moment went off. The teacher attempted to locate the guilty one but could not, and as a result of her failure punished the entire group. Discuss the wisdom of her method.

8. What social virtues can be taught through an effective program of social control?

9. A son of a member of the board of education is made, through home influence, to feel that he has privileges others do not have and as a result becomes a source of trouble in school. How should you meet this situation?

10. Under what conditions, if any, may a noisy classroom be under good control?

References for Further Study

Bagley, W. C., "Classroom Management," Chaps. VII, VIII, The Macmillan Company, 1920.

——— "School Discipline," The Macmillan Company, 1923.

Betts, Geo. H., "Classroom Methods and Management," Chaps. XXI, XXII, Bobbs-Merrill Company, 1922.

Briggs, Thos. H., "The Junior High School," Chap. X, Ginn & Company, 1920.

Colvin, S. S., "An Introduction to High School Teaching," Chaps. IV, V, VI, The Macmillan Company, 1917.

——— and W. C. Bagley, "Human Behavior," Chaps. X, XI, The Macmillan Company, 1913.

Cubberley, Ellwood P., "The Principal and His School," pp. 265–281, Houghton Mifflin Company, 1923.

Davis, S. E., "The Work of the Teacher," Chap. V, The Macmillan Company, 1920.

Holley, C. E., "The Teacher's Technique," pp. 20–29, The Century Company, 1922.

Judd, C. H., "Introduction to the Scientific Study of Education," Chap. XVII, Ginn & Company, 1918.

Kilpatrick, W. H., "Source Book in the Philosophy of Education," Chap. XII, The Macmillan Company, 1923.

OVERSTREET, HARRY, "Influencing Human Behavior," Chaps. I, II, W. W. Norton Company, 1925.

PARKER, S. C., "General Methods of Teaching in Elementary Schools," Chap. III, Ginn & Company, 1922.

PHELPS, W. L., "Teaching in School and College," Chap. II, The Macmillan Company, 1918.

ROBBINS, C. L., "The Socialized Recitation," Chaps. II, IV, Allyn Bacon Company, 1920.

SEARS, JESSE B., "Classroom Organization and Control," Chap. VI, Houghton Mifflin Company, 1918.

SMITH, W. R., "Constructive School Discipline," American Book Company, 1924.

STARK, W. E., "Every Teacher's Problem," American Book Company, 1922.

STRAYER, G. D., "A Brief Course in the Teaching Process," Chap. XV, The Macmillan Company, 1920.

WAPLES, DOUGLAS, "Procedures in High School Teaching," Chap. VI, The Macmillan Company, 1925.

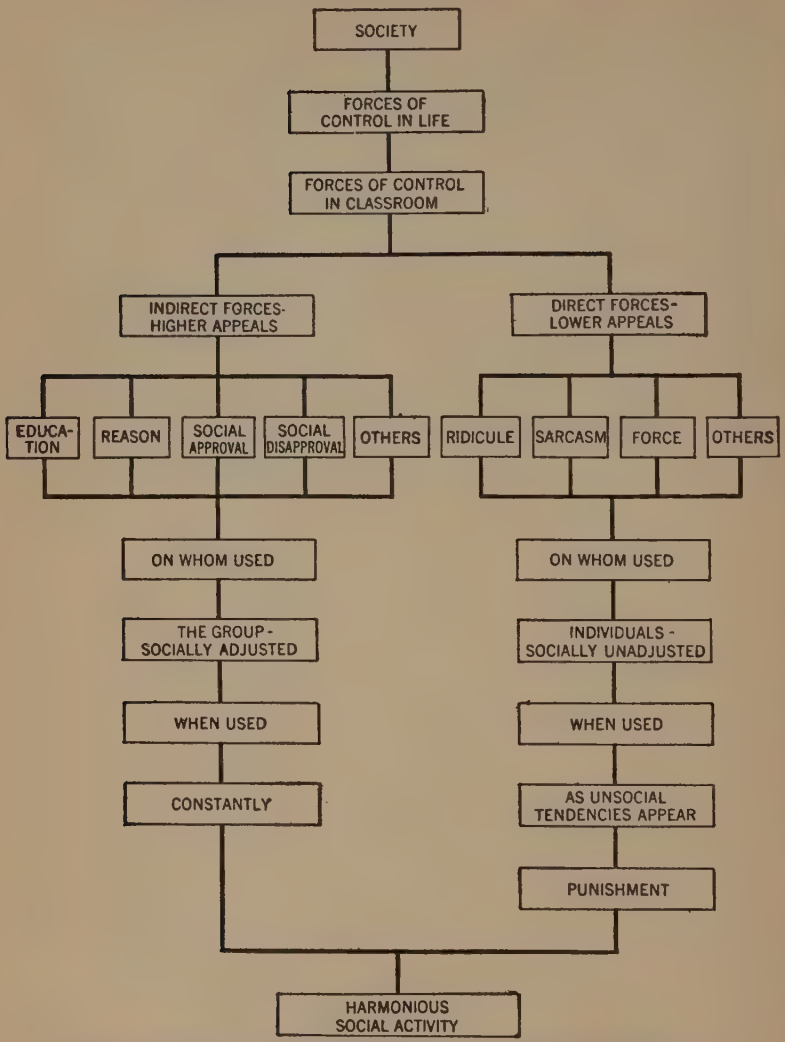

Fig. 12.—Graphical representation of the content of the chapter, Social Control.

PART II

PRINCIPLES AND FACTORS CONTROLLING TEACHING

Chapter VIII

THE LESSON ASSIGNMENT

I. IMPORTANCE OF AN ASSIGNMENT

Teachers quite universally report that it is increasingly difficult to induce students to study. One very specific reason for this is that studying is generally undirected. A combination of home study and the common study hall quite largely prevails today. In the case of the former, the school has practically no control over the methods utilized. The traditional study hall is hardly a feeble attempt at directed study for its organization does not provide for expert direction. The "supervision" is conducted by any of the teaching or administrative force who do not happen to be otherwise engaged. Obviously, great waste follows such inadequate practices, a condition which slow educational readjustment alone will remedy. In the interim, however, teachers must adapt their techniques to existing conditions.

The study problem is one of great moment regardless of the extent of the direction provided. In fact, it is of such importance that an entire chapter of this book is devoted to its consideration. As the possibility for direction decreases, the teacher's task increases proportionately. Thus, with our traditional plan of home study and study halls the teacher is charged with the obligation of controlling study purely by indirect means. He must exert a herculean effort to make school work appear so alluring that study will be a pleasure. All obstacles in the way of successful completion of the school exercises must be carefully cleared away. He must present the advance work in a manner which will facilitate the free operation of the laws of learning. Instruction in evaluation of material and plans of attack to assure successful effort must be given. Much of this the teacher must accomplish during the assignment of lessons.

The assignment is an exercise of infinite value, since to a large degree it determines the effectiveness of study pursuits. It is the "open sesame" to learning, and, as such, should receive much careful consideration by the teacher. He should thoroughly understand its functions and the technique of its use. He should, indeed, plan for it quite as carefully as he does for the recitation and should dignify it by allotting sufficient time in the class period for its adequate application. The assignment is really a most powerful teaching agency, the functions of which are so far reaching and the administration so difficult that it offers a challenge to all teachers.

It is unfortunate that so many either fail to understand the importance of this teaching exercise or they are careless in its use. How often we hear shouted above the turmoil of a noisy dismissal, "For tomorrow's lesson take the next eight pages!" And yet the teacher who "parcels" out the advance work in this manner feels that he has reason to expect his students the next day to give a well-organized, clear-cut, intelligent reply to any questions he may choose to ask. He further considers that if the students do not study these "eight pages," they have been refractory, and have flouted the authority of the school. If they do not "thrill" over the marvels of the subject matter and its implications, they are queer, and if they encounter any difficulties in its mastery, they are mentally inferior!

As a rule, when a teacher receives undesirable responses from the students he may assume that he has somewhere failed in his technique. The real explanation is that the laws of learning were not made to operate. It is the purpose of this chapter to outline a procedure designed to make use of these laws.

II. FUNCTIONS OF THE ASSIGNMENT: PROCEDURES

1. Define Limits of the Task.—Subject matter, problems, exercises, or any other types of learning material supply the stimuli for learning reactions. We learned in Chap. IV, that when one reacts to this learning material a nervous discharge is effected which passes over certain synaptic connections rendering more permeable the path taken. It is our interest, as teachers,

so to direct the students' mental activities that only those connections are made which are desirable and lead to the attainment of specific ends. There are, for example, many lines of attack that one could pursue in the study of almost any lesson. The particular one chosen will be determined by the child's mind set during study. Attacking the material from one point of view will yield a certain mental product while study of the same learning situations, with a different objective, will result in another. The physical limits of the assignment are identical but the psychological limits need careful definition.

Hence, to assign a certain number of pages with no designation of purpose does indeed clearly indicate where the learning material is to be found, but it fails to direct the attention toward the objectives sought. The writer observed such a "page assignment" made in an American history class on the material covering the discovery of gold in California. The subject matter was capable of offering the stimuli for many different types of learning reactions. With one mind set, for example, an alluring story would be learned. With a different viewpoint this narrative would furnish the data for the solution of a problem involving the economic and social effects of this discovery. It is the same content with but one physical limit, that is, a certain number of pages, but which can be used by students to arrive at many different types of learning.

The teacher of the class in question had "hoped" that the pupils would interpret the discovery of gold in terms of its economic effect upon the country. What the class really did, however, was to learn the facts of the story alone. They gave a splendid reproduction of the narrative, vivid in many of its details, but they had no conception of the significance of the facts. Their response was perfectly legitimate for in the absence of objectives set by the teacher they chose their own and conscientiously strove to attain them. That they made the wrong reactions was no fault of theirs. It would have been a simple matter for the teacher to have directed the type of emphasis to be placed in the study of this lesson. Such direction would have functioned in the selection of the correct attack and this in turn would have acted as a determining agent, enlivening those synap-

tic connections which were pertinent to the accomplishment of the desired ends and inhibiting those which were not.

A similar situation was found in the case of a teacher who assigned ten problems in elementary algebra. He had just finished a preliminary discussion on simple, simultaneous equations after which he assigned the ten problems, without making any explanation as to how they were to be solved. The problems were of such a simple nature that they could be readily solved by use of simple arithmetic. The majority of the class, not having been instructed to do differently, solved them in this way. They did not make the desired reactions because the teacher had not indicated what class of connections were to be made, and thus, childlike, they made those requiring the least effort.

So we see that it is of infinite importance that the teacher project his school exercises so that they have both physical and psychological limits. Even in such subjects as mathematics, science, modern language, and the like, where there is great precision and less opportunity for a confusion of aims, care must be exercised to define the tasks so that the formation of the desired bonds may be made.

In general, teachers are not free from blame if their students fail to prepare their lessons because of misunderstanding the assignment. It should be so "painfully" explicit that no one could possibly misunderstand its ramifications. To be sure, there are some pupils who will attempt to cloak their study inadequacies with a "misunderstood" assignment, regardless of how careful the teacher may be. Situations of this sort may be easily controlled, first by being absolutely certain that every assignment is clear to all, and then treating delinquencies as flagrant disregard for authority. This type of student will soon realize that such gestures are valueless.

The real test of clear, intelligible assignments is a uniform response consistently bearing upon the objectives set by the teacher. Class confusion over the assignment is more often an indication of the teacher's inefficiency than it is a cause for reprimand. Unfortunately, teachers who experience this type of class difficulty seldom take the responsibility to themselves, for

it is much more comforting and satisfying to charge it up against the pupils' lack of effort.

a. Procedures to Secure Clear Understanding.—There are a few suggestions which may assist the teacher in assuring clarity of the assignment. In the first place, he should learn to use his voice so that it can be distinctly heard in every corner of the room. This involves clear enunciation and sufficient carrying qualities.

The assignment should be given at a period when the entire class is giving active attention. The quite common practice of giving out the assignment during the confusion of a noisy dismissal is obviously in violation of this principle. In addition, it precludes the opportunity of introducing the various phases of assignment technique which will be discussed below, for the dismissal period is exceedingly short. Another similar practice followed by some teachers is to project the advance work at a time before the class is officially called to order. Should any students be slow in reporting they will miss the assignment. If they are of the conscientious type they will inquire what the assignment is, but there are many others who would seize upon this situation as an excuse for the next day's lack of preparation.

Another device to insure against "forgetting" is the permanent-leaf assignment notebook. If the teacher insists that this be brought to class each day and a record of each advance lesson kept, it will serve as a systematic method to eliminate invalid excuses of this sort.

Some teachers, to check on the clearness of their assignments, call upon a student to repeat what they are to do for the next day. If such student can give a clear notion of what the advance work comprises, these teachers take it for granted that the assignment is understood by all. Still another method is to post outside the class an "assignment book" in which a delegated monitor at the close of the period writes out a statement of the required work for the next day. This usually fails in that it shows only the extent of the work and does not indicate specifically the use the students are to make of the material assigned. This objection could be obviated by the careful direction of the teacher.

These devices suggested are but a few of a great many which may be used to insure clarity and precision in the understanding

of the assignment. The teacher should carefully study his class and adjust his methods to meet varying demands. He should, as in the case of all devices, adopt them on the basis of need.

2. **Adjustment of Tasks to Capacities of Children.**—It is psychologically unsound to project a task to children, phases of which are too difficult for the particular group, for satisfaction (law of effect) cannot follow unless the act is successfully completed. To bring an assignment just within the ability of the group by clearing up any overwhelming difficulties without removing the legitimate challenge of the exercise is no simple task. The teacher must, in his assignment, provide for any needed assistance. To give too much, however, is weakening to learning, while to give too little results in the failure of the project. A thorough knowledge of child nature and the ability to interpret subject matter in terms of it is necessary adequately to apply this function of the assignment.

Subject matter is selected racial experience. It includes the record of the most desirable ways of meeting problems of life. Some writers have thought that the ideal way to stimulate learning would be to send boys and girls through the same experiences through which the race has passed and in the same manner. Common sense teaches that such a method cannot be used and it is well that it is impossible, for much of this experience came as a result of great hardships and intense suffering. Further, we must consider that in the few short years of a child's life we attempt, through the agency of textbooks and other devices, to impart the results of this racial experience which has taken ages to develop.

Is it not highly probable that in the endeavor to give students this knowledge, which is the heritage of time, some phases of it will be too difficult for them to grasp without assistance? Consider for example, the atomic theory in chemistry, the electron theory in physics, laws of heredity in biology, number system in arithmetic, our political problems in history, and in fact, almost any phase of educative material from any subject; countless men and women have spent their whole lifetime developing this material for us. Geniuses who were masters in their particular fields were baffled by their intricacies.

Can we reasonably expect the immature minds of boys and girls to grasp the significance of such knowledge, which has in the past held the world's greatest intellects at bay, by simply turning them loose on textbooks which barely outline the results of such researches? It is, of course, true that in textbooks the material is greatly simplified and stripped of most of its technical phases. Nevertheless, the fact remains that in spite of its facilitated presentation it still includes aspects which, if uninterpreted, are beyond the grasp of students. To insure the successful completion of a learning task is a phase of assignment technique which teachers must carefully observe.

3. **Develop Readiness for Advance Work.**—When the child has been put in a state of readiness, we have a real assurance that he will study. One of the greatest, if not the greatest, functions of the assignment is to create this mental condition. In such a case as that of the "page assignment" already discussed, it was most likely irksome for the students to study, for the teachers ignored those psychological exercises which make certain bonds ready to act. They merely superimposed the task upon the students without any attempt to utilize the laws of learning.

It is true, of course, that learning can be effected by coercion. But when such force is used the motive is external and the mental product less lasting. The student realizes that he *must* get his lesson to escape punishment or mental discomfiture and, hence, study is a source of annoyance. However, when he has been made ready to learn by the establishment of powerful appeals to his original nature and the recognition of felt needs for the work, he experiences genuine satisfaction from making the effort. School work thus becomes purposeful, has deep significance, and leads to permanent mental equipment.

Still another phase of the problem is that when a child has a whole-hearted desire to learn, the work of the teacher is materially lightened. He can to a greater degree perform his major purpose, that of directing learning, for his students will eagerly take all he will lay out for them. There is a concomitant variation between readiness and coercion for the higher the degree of the former, the less emphasis is needed on the latter. Our great hope in the

stimulation of students toward study is to make them ready to act and thus eager to do so. Skillful use of the many different methods of developing readiness will, generally speaking, place the students in a condition of great enthusiasm and eagerness to "go" as soon as the class period closes. Several methods of applying the law of readiness in making an assignment follow.

a. Use of the Problem.—Most boys and girls are interested in solving puzzles. By utilizing this proclivity in the projecting of school tasks, the teacher will align learning with child tendencies. In school work, the nearest approach to a puzzle is the problem; the fundamental elements of each are essentially the same.

So, if the teacher can make use of the problem in the assignment, he is making a strong bid for the student's active interest. He is immediately ready to act, for the task is in a form which gives him pleasure to attack it.

Among others, one outstanding reason for the intense satisfaction following the successful solution of a problem is its definiteness. When the solution is reached, the students have accomplished something the results of which are tangible. There is no guesswork as to its limits or ramifications; this problem was assigned, this problem is solved, and the task is complete. In content subjects, when problems are not used, students may study with great care and in a most conscientious manner yet not be certain that they have completed their assignment. They may have, to the best of their ability, tried to learn what was set for their mastery, but they are never sure that they have successfully completed their task until after the teacher has applied his stamp of approval. But such is not the case when a problem is assigned; the successful completion is apparent.

It is obvious that some subjects, such as mathematics and sciences, lend themselves to the problem assignment more readily than the content type. There is no subject in the curriculum, however, in which some form of problem work cannot be used.

b. Use of Suspense.—Suspense is a tremendous power which, if applied judiciously, can hold the breathless interest of people over long periods of time. Every well-written story makes use of it, holding the readers' attention to the very end, for who would think of leaving a story until he knows "how it comes out."

Even business uses it. Are not the sales of many of our popular periodicals made in part, at least, because of the lure of the continued story? The device, suspense, makes use of the instinct of curiosity which is strong in most individuals.

We can use suspense as a potent force for the development of readiness in making an assignment. Its utilization, as such, involves the presentation, in an appealing way, of just enough of the advance work to arouse the student's curiosity, leaving him there to finish "the story" by himself. The possibilities of this device are almost immeasurable for its use is, in fact, limited only by the teacher's ability to administer it effectively. Illustrations of the actual classroom use of this device will make clear its application.

A teacher of history was observed who used suspense in making an assignment on Burgoyne's invasion in the American Revolution. She said, "We have reached the most important part of the war for we are now at its turning point. Burgoyne had determined to cut New York State from the New England and southern colonies." At this point she stimulated a short but well-pointed discussion on the probable effects of such isolation. She then continued, "St. Ledger was to proceed to Albany by way of the St. Lawrence River and the Mohawk Valley; Burgoyne had the same objective, going by way of Lake Champlain, and Howe was to come up to Albany by way of the Hudson. The colonists' cause was now in great danger for these generals were of England's best. A life and death struggle was at hand. This story is one of the most interesting we can find." By this time the children were agog with interest. The teacher then announced that the conclusion of this interesting story could be found on a certain page in their textbooks. Indeed no coercion was needed to induce the class to "finish the story" for they were *ready* to do so.

A teacher of biology showed the class an amoeba which he had located under a microscope, and then told them that this was a one-celled animal so small that it was indiscernible to the naked eye. He asked them if they thought that this infinitesimal bit of protoplasm could carry on all of the same life processes as does man, including feeding, digestion, excretion, respiration,

reproduction, and the others. Some thought that it could, but the greatest number thought not. A short discussion followed which was concluded as soon as it became most interesting. He then told the class that they could find an alluring account of this very subject in their textbooks, giving them the specific page reference.

The writer observed an English class which was put in a state of readiness for the study of "Ivanhoe" by this same method. The teacher selected some of the most vitally interesting phases of the life of Robin Hood and told them to the class in a most dramatic and attractive manner. She aroused the group to a point of intense interest and when they were at the highest emotional pitch she mentioned that accounts of further activities of some of Robin Hood's followers could be found in "Ivanhoe."

c. Establishing a Felt Need.—When a real need for material to be studied is created in the minds of children, it gives purpose and direction which furnish a drive for learning. It places them in the position where they feel that a necessary bit of knowledge or skill is lacking and they are thus balked in the performance of some highly motivated activity. If, for example, a boy is bent upon making an airplane glider from plans which are often given in magazines or newspapers, he will not hesitate to learn to perform all of the necessary operations. The acquiring of new knowledge or skill is a pleasure for they are *needed* in the accomplishment of the main objective. The attainment of such learning may, indeed, require much laborious effort and intense concentration, but the obvious need for it reduces what would be otherwise irksome application to pleasure and satisfying endeavor. Hardly, if ever, can be found a more compelling stimulus for exacting application than the intense drive of felt needs.

A case in point is that of a teacher who developed a motive for learning the cancellation process in arithmetic. This teacher set the class to work on a problem of simplifying a fraction which she had placed on the blackboard. Purposely she designed it with large factors in both the numerator and the denominator, calling for much troublesome multiplication and division if cancellation were not used. While the students used the longer

method at their seats she herself resorted to cancellation at the blackboard to get her answer. She repeated the process a number of times until the class was quite tired of multiplying and dividing, she, of course, always using the short method. After about fifteen minutes of such work she called the students' attention to her method which was much shorter, and required less energy. She then set them to work on a group of ten examples of the same type given in their arithmetic books with the statement that she would be glad to explain "her" method of doing the work to any who might be interested. Almost immediately one of the brighter children, seeing the possibility of completing his lesson with less effort, came up for special instruction. Soon another followed and then others until, at last, most of the class was clamoring for instruction in the cancellation method, which was then taught with little difficulty, for the students were *ready* for it.

d. Use of Handwork.—Oftentimes a drive can be occasioned by the introduction of handwork. This makes an appeal through the instinct of manipulation. Such a method is particularly well suited for those individuals who are inclined toward manual dexterity.

The writer observed a Latin class where the teacher made use of this method of developing readiness. There were a few boys in this group whose interest in the subject was hopelessly small. One day the teacher tactfully suggested that working models of some of the machines used in the time of Caesar would be a valuable addition to the school equipment. She explained that they would be of great service to those whose mechanical aptitudes were limited. The interest of these boys was soon enlisted and they set out on the task of constructing them. Before long this teacher had some excellent working models, permanent in form and perfectly illustrative in nature. Of course the teacher's primary interest was not in the finished products, even though she manifested great enthusiasm in them. Her aim was to kindle a live interest in a subject which these students felt was distasteful. To a very large measure, she accomplished her purpose, for a point of contact was firmly established and Latin seemed less "dead" to them.

The same type of technique was used by a teacher of geometry who created an active interest in his class by setting the students to work on the construction of geometric models from cardboard. Some very valuable permanent contributions were made. Not the least in importance, however, was the fact that it developed a readiness for the study of geometry.

The use of hand work has many ramifications and can be applied in almost, if not all, of the subjects of the curriculum. Safeguards must be taken in its administration so to control it that the interest does not center in the constructed product. The teacher must manipulate the interest so that it is shunted to the subject, with the attendant desire to learn.

4. **Account for Individual Differences.**—It has been pointed out elsewhere in this book that in each class is found a great variation in the mental ability of the children. Obviously, the teacher cannot make her assignment so difficult that it will challenge the full capacity of the superior children, for if such were the case the requirements would be far beyond those who are average or below average in ability. Herein lies a difficult problem for the teacher, as it is, indeed, a mistake to launch any educational program designed for the middle fifty per cent of the class, meanwhile making no provision for those who are competent to do more. Testing surveys reveal that by use of our minimum essential assignments so commonly in vogue the brighter members of the class develop the habit of working below capacity. Such habits may, if not corrected, circumscribe the ultimate efficiency of such individuals.

In some instances this problem is met by classifying and grading pupils on the basis of intelligence. But this movement, important as it may be, is not making as much progress as its value warrants. Only the larger cities and some few progressive villages make any attempt to finance and organize such a project.

The teacher in a very small way, in a class heterogeneously grouped, can attempt to account for individual differences by making individual assignments. Those students who are capable of doing more than just average work can be given tasks in addition to the regular allotment which will cause them to work

to greater capacity. This extra work, if tactfully assigned, will be accepted willingly by the children. It may be projected by putting it on the basis of a social appeal; for if the students feel that they are contributing to the advancement of the group there is a social urge which helps to motivate its preparation.

5. **Assist the Pupil in Study.**—It has been mentioned that to get students to study is a real problem which can be solved in part, at least, by adequate assignment technique. It is equally true that even though a readiness to study has been developed, there exists a great deficiency in knowledge of correct study methods. This is a source of great waste, for of what value is highly developed purposes if, through lack of proper mental equipment, these purposes cannot be successfully accomplished? If we could fortify readiness to learn with the knowledge of how to learn through proper study technique, success would inevitably follow. Suitable provision for the law of effect would then be made.

The subject matter of a course of study, despite all a teacher can do to make it otherwise, appears "disjointed." Thus, wherever possible, emphasis on its continuity is essential. The assignment offers an opportunity to establish this relationship between lessons. By a few skillfully directed statements the content of one lesson and that of another can be definitely welded together.

There is nothing mystifying about the fact that students have great difficulty in placing proper emphasis during study. Their experience in the field of learning is limited and it is only through experience that one can determine relative values. The teacher has had this experience, thus through the use of the assignment he can assist the students in the needed evaluation. With open books he can point out those devices of service in the selection of the vital material, such as the use of the topical headings, topic or key sentences, and others. Also, training in the ability to develop an outline is an important aid.

Not the least important element of this problem is to teach the students to synthesize after an analysis has been made. This constitutes the ability to build up the lesson with all of its appli-

cations from its constituent important elements. The students must learn definitely to fix those bonds that must become permanent and to repress those that have been of a subsidiary or determining nature.

It is important to note that the need of emphasis on this function of the assignment if skillfully used, grows less as time passes, for gradually the students will develop the desired abilities and hence need less guidance. As evidence of increasing skill appears, the teacher should diminish his stress on this type of assignment technique.

III. OTHER ASSIGNMENT TECHNIQUES

1. When to Make the Assignment.—There is no general rule which can be observed governing the time the assignment is to be made. Some teachers prefer to make it at the beginning of the hour. Certainly such teachers are never stinted for time for they can take as much as is needed. It has the disadvantage, however, of destroying the continuity between the present and the advance work.

Others give the assignment at the end of the period in the attempt to make one lesson "grow" out of another. Such a practice is acceptable if the teacher is careful to estimate the variable amount of time needed and then to use it for assignment purposes only. There is a great temptation, when under the pressure of covering material in the recitation, to slight the assignment and attempt to crowd it in as if it were an afterthought. As has been suggested, it cannot be efficiently made in the confusion of a noisy dismissal, nor can it be in the short period between the warning and closing bells.

Again, there may be occasions where it would be advantageous to make the assignment sometime during the class period. When a phase of the work arises, during the regular lesson period, which leads into the advance work it would be strategic to assign it at that time. A safe rule is to make an assignment at such time as seems most natural for its occurrence.

2. Time to Be Allotted.—The time for the assignment is another matter which is indeterminate. Some lessons have few

or no difficulties; others are extremely complex and require much supplementing. Again, there are those which are so vitally appealing that the exercises in themselves are purposeful and need no coordinating to establish readiness. Then, on the other hand, some require much effort and the use of much ingenious technique to motivate their study.

The great variability in types, content, and sequence of lessons eliminates the possibility of suggesting any fixed rules concerning the time limit in making the assignment. True, some authorities do try to divide the class period into so many minutes for review, so many for the actual recitation on the assigned material, and so many for making the assignment, but the use of such a mechanical division is highly questionable. Even though such a schedule represents but an average, it is of little or no value to the teacher, for it gives no assistance where help is most needed, in the case of the difficult assignments requiring more extended time.

One valuable suggestion, indefinite though it is, is to take as much time as is needed. Assuming effective technique, the time utilized is not wasted; it is invested and pays big returns in learning. The teacher must ever be mindful of the fact that the assignment is more than an opportunity merely to apportion advance work, it is a powerful learning agency. Those who feel that time is wasted in its use have failed to grasp its significance and the tremendous scope of its possibilities. The recitation is important as a subsidiary agency of learning and the fact must not be discounted that the fundamental basis of learning is laid during the process of study.

This being true, great stress should be placed upon study, and any agencies used to make study more effective are a necessity. Other things being equal, the assignment should involve the use of a sufficient length of time to insure real learning through subsequent study. A lesson so assigned as to insure abundant use of the laws of learning yields greater returns to learning than lessons assigned with no regard for these laws.

Problems and Exercises

1. A teacher of first-grade English found that some of her students persistently failed to study their lessons. The class was studying "Ivanhoe" which, if pre-

sented correctly, would make a strong appeal to most boys and girls. Select a portion of this book and work out an assignment which would provide for developing readiness for the study of this unit.

2. In a beginning plane-geometry class the teacher assigned the advance work in this manner: "For next time study proposition theorem number fifteen and the two corollaries." No other suggestions were made. Invariably the students reported that they could understand each step in the solution, given in their textbooks, but when tested failed in the ability to reproduce what they had studied. Select one of the proposition theorems in book one and work out an assignment covering clearing up of difficulties and giving study suggestions such that students would not only understand but be able to reproduce, as well, the steps in the solution.

3. A teacher of European history reported that her students "failed to read between the lines" during their study. They were conscientious in their preparation for they could, with little difficulty, recite on the facts of the lesson, but they failed to grasp the implications involved. Her assignments were page assignments defining the physical limits with great exactness. What should she do to solve this problem?

4. Two boys in a physics class had divergent views on the extent and scope of the lesson assigned the day before. The teacher passed this by at this time as a reasonable misunderstanding, but it occurred again and again much to the pleasure of the rest of the group. Devise a diagnostic scheme which would get at the probable cause of this situation and suggest remedies.

5. In a certain school system it was a regular practice for absentees to report to class on their return to school without having prepared their advance lessons. They truthfully stated that they could not do this if they did not know the assignment. Suggest procedures which would remove this difficulty.

6. A teacher of third-year English literature attempted to develop readiness for the study of an assignment in "Macbeth" by using the "continued story" idea. Upon leaving the room one of the boys was heard to remark, "I see through her game, that stuff's just to get us to study." What probable mistakes did this teacher make in the use of her procedure.

7. In a class in economic geography a problem arose at the beginning of the period which took almost the entire period to solve. The teacher of the class said, "Take the same assignment for next time." Discuss.

8. Give reasons for and against the practice of making weekly instead of daily assignments.

9. A student of education stated, "There is so much to the technique of making an assignment that if we observe it all we will have time for little else during the period." Refute this objection.

10. On the basis of the laws of learning, discuss the advisability of making assignments which are too long.

11. What difficulties will a teacher encounter in making his first problem assignments to groups who are accustomed to the traditional "page assignments"?

References for Further Study

BAGLEY, W. C., and J. A. KEITH, "An Introduction to Teaching," Chap. IX, The Macmillan Company, 1924.

CHARTERS, W. W., "Methods of Teaching," Chap. XXIV, Row, Peterson & Company, 1912.

DAVIS, SHELDON E., "The Work of the Teacher," Chap. VI, The Macmillan Company, 1920.

EARHART, L. B., "Types of Teaching," Chap. VIII, The Riverside Press, 1915.

HALL-QUEST, A. L., "Supervised Study," Chap. VIII, The Macmillan Company, 1916.

HOLLEY, C. E., "The Teacher's Technique," Chap. V, The Century Company, 1924.

PARKER, S. C., "Methods of Teaching in High School," p. 394, Ginn & Company, 1920.

SEARS, J. B., "Classroom Organization and Control," Chap. XIII, Houghton Mifflin Company, 1918.

STRAYER, G. D., "Brief Course in the Teaching Process," Chap. VIII, The Macmillan Company, 1920.

STORMZAND, M. J., "Progressive Methods and Teaching," Chap. II, Houghton Mifflin Company, 1924.

THAYER, V. T., "The Passing of the Recitation," Chap. XIX, D. C. Heath & Company, 1928.

WAPLES, DOUGLAS, "Procedures in High School Teaching," Chap. X, The Macmillan Company, 1925.

WILSON, H. B., G. C. KYTE, and H. G. LULL, "Modern Methods in Teaching," Chap. XIV, Silver, Burdett & Company, 1924.

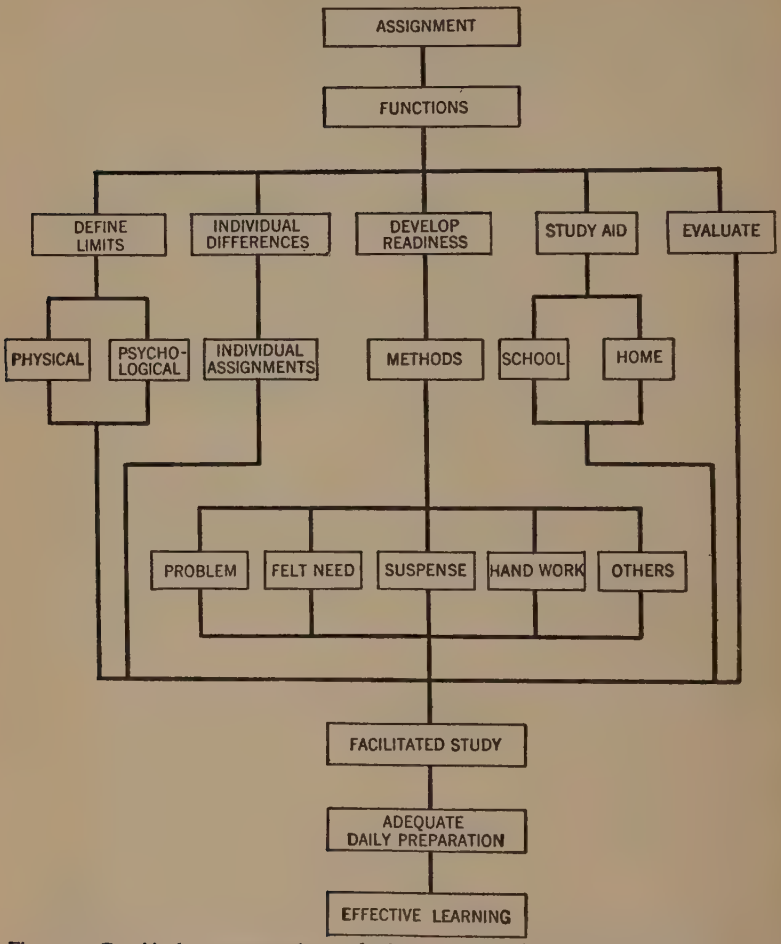

Fig. 13.—Graphical representation of the content of the chapter, The Lesson Assignment.

Chapter IX

THE RECITATION

I. FUNCTIONS OF THE RECITATION

1. Exercise of Desirable Bonds.—It was briefly suggested in the last chapter that the foundation for learning is laid during the study of a lesson. The subject matter used offers the stimuli to which the mind reacts and as they confront the learner neural pathways are forced over synaptic connections. As we learned in Chap. III, the continued exercise of bonds under certain definite conditions makes them increasingly permanent. A psychological change takes place in the synapses of the nerve structure which through the agency of exercise, augments its permeability for the passage of nerve energy. Thus, the frequency of making a certain reaction lessens the resistance to the flow of nerve current over paths effecting this response.

If, for example, a student in algebra reacts to $a^2 \times a^3$ with a^5, the discharge of nervous energy leading to the correct reaction, a^5, passes over that specific synaptic connection controlling this response. This, other things being equal, makes the connection controlling the a^5 reaction slightly more permeable than any other, such as a^6. But unless the a^5 connection is exercised sufficiently to make it *abundantly* more conductive than any other, the student, after a short time through disuse, will be almost as likely to react with a^6 as with a^5 for the one connection will then be no more of a conductor than the other.

If we could, during the student's study, provide for enough exercise of desirable bonds only, there would be little need for a recitation or any other learning facilities. Our school program would consist merely of setting up that type of environment and instituting those controls which would lead to adequate learning during the process of study.

The results of experience indicate, however, that sufficient exercise cannot be provided by the individual work of the students. Some carefully controlled agency under the supervision of the teacher is a necessity. The recitation, if properly conducted, is, by its nature, peculiarly designed to fit this purpose with great efficacy. By one specific direction of emphasis it provides for repetitions which help to crystallize the formation of skills and habits. By another comes the development of the various types of appreciations. Still a third type of emphasis results in the ability to use learned facts, processes, and skills so as to make them serve in the solution of problems and definite applications to life situations.

It is at once obvious that the type of exercise will be selected by the teacher on the basis of objectives. He will analyze the subject matter in the terms of the aims and then direct the student's study during the assignment to effect their attainment. The exercise of this learning should be provided for during the recitation.

2. **Modification of Undesirable or Incorrect Bonds.**—Despite all of the safeguards that a teacher may take, children learn incorrect reactions. "The golden rule is the brass edge of a ruler," "The alimentary canal is a New York state water-way connecting Lake Erie with the Hudson River," "A spectrum is a ghost-like figure appearing in sunlight." "A hypotenuse is that part of a geometric proposition assumed to be true," "An idyll is something to be worshiped"; such reactions are typical of those made in almost any classroom and in all subjects. They are the result of a nervous discharge over the wrong synaptic connections.

It need not be emphasized that such misconceptions should not go uncorrected. The recitation offers a means of checking the accuracy of knowledge and providing such modifications as are demanded. When any inaccuracies are detected more, however, than mere correction by the teacher is needed. Abundant exercise of the modified reaction is necessary to provide for the permanence of corrected learning.

3. **Provide the Influence of Social Stimuli.**—The social recognition of worth provides for the effective use of the law of effect

by means of the intense satisfaction that follows. In the normal individual a desirable emotional response results from social commendation either asserted or implied. We do not hesitate to repeat the same act or those similar to the ones we have previously performed with success. In some small measure a properly administered recitation develops this opportunity for satisfaction.

An analogy, which perhaps does not fit in every detail but fits in the case of the major elements only, will make clear the significance and meaning of this use. At one time it fell to the writer to direct high-school theatrical productions. It is the common experience of those working in this capacity to find that the chosen cast will work for weeks training for that memorable evening when they will present their "wares" to the public. These boys and girls willingly work for hours and hours, arduously and faithfully, to perfect their performance for the "big night." They become tired and careworn, but never regretful of their undertaking. They gladly give up social affairs, remunerative work, and even, in some cases, athletics for the chance to play a part; no sacrifice is too great to make for the opportunity to "appear."

During the training the students learn their lines to a high degree of perfection. They learn how to walk across the stage naturally and without embarrassment, how to control their voices so as to be heard at all points in the hall, and to express different types of emotions. They learn when to raise their eyebrows, when to scowl, when to smile, when to stand, when to sit, and, in fact, all of the almost limitless reactions needed in the interpretation of their parts.

At first, all of these reactions seem unnatural and difficult to the players, with the result that they are performed mechanically. But gradually, through constant exercise, the mechanical aspects are pushed into the background and what they have gradually learned becomes a part of them.

Now they are ready for the "big event." Dramatic coaches know that no rehearsal, particularly the dress rehearsal, gives any index of the quality of the final presentation. Only those who have had the rich experience of working with young people on such projects can appreciate the thrill the performers get as they

wait behind the scenes for the first "curtain." Finally it rises and the play is in progress. A revelation is taking place! They are performing as never before. They are more natural; they have a richer, deeper sense of the interpretation of their characters. They have an unusual mastery of themselves. They are making new reactions (some good and others not). They are indeed performing as if inspired—but why?

The social stimulus of an appreciative audience inspires them to herculean effort. It is a force which helps to weld all that they have learned into a greater unity of action. The mechanical phases of the learning are now completely gone, for these performers are more nearly what they represent. The explanation of this smooth, masterly performance is found in the feeling of approbation expressed by the audience. There is present a tremendously potent stimulus calling forth concentrated, purposeful effort. They are not "practicing," they are" parading" the results of great painstaking effort; the practice came first but the "display" was its crowning glory.

To some extent the classroom offers the same opportunity for the operation of this social impetus. During study (rehearsing) the students are perfecting a mastery of knowledge, processes, and their uses which can be displayed to their fellows and teacher. The approbation of the members of the social group paves the way for intense satisfaction, spurring on to greater endeavor.

4. **Testing the Preparation of Assigned Work.**—The importance of the recitaton lies in its functional relationship to learning. The stress of the teacher should be centered in the manipulation of the opportunities it offers to make it coordinate perfectly with the study process. An ideal to work toward, obvious in itself but oftentimes neglected, is the elimination of all practices which are not directly contributory to learning.

With this in mind, it quite readily follows that the practice of utilizing the recitation to determine who have failed to study, and what quantitative value must be attached to each pupil's reaction, is often quite largely overemphasized. There are those teachers who recognize no other use of the recitation than this and thus sacrifice some of its greatest teaching advantages. This type of testing has its place but it is indeed relatively unimportant.

It is, of course, true that students must be made to study, but it is equally true that study will take care of itself with the use of skillful assignment technique. There are, however, situations where even expert teachers are completely balked in their efforts to stimulate a state of readiness for study. Such flagrant lack of preparation must be sought out in order to apply coercive measures. The teacher must be mindful of the fact, though, that since force is the least productive of all agencies, he must use it only as a last-resort measure.

There is a need for the checking of inadequate preparation and the recitation can, in a small measure, assist in the accomplishment of this purpose. "Small measure" is indeed used advisedly for there is an abundance of objective data which proves conclusively that subjective testing, such as that carried on in the recitation, offers but a slight indication of the learning acquired. The teacher's judgment of worth is affected by many variable factors of an emotional nature which make a scientific, objective analysis impossible.

Convincing illustrations of the failure of subjective testing is given by Starch[1] who says,

> . . . Starch and Elliott made a series of investigations in which two final-examination papers in first-year high-school English were graded by 142 English teachers in as many high schools; one final-examination paper in geometry was graded by 118 teachers of mathematics; and one final examination paper in American history was graded by 70 teachers of history . . . The differences are outstanding; the marks for any given paper run practically over the entire range of the percentage scale ordinarily used. The marks of the first-year English paper run all the way from 60 to 98, of the second English paper from 50 to 98, of the geometry paper from 28 to 92, and of the history paper from 43 to 90.

This confusion resulted not from snap judgments made on the spur of the moment in the classroom, but rather after careful and studied effort. Consequently not less erroneous would be the decisions on oral products of the recitation, made with lightning strokes, more subjective in method.

[1] STARCH, DANIEL, "Educational Psychology," p. 433. Quoted by permission of The Macmillan Company, publishers.

In face of the great inadequacies of subjective testing, most schools require it. It is necessary for the teacher to use it, but in its use he should not lose sight of its limitations. With practice, a fair degree of skill in qualitatively judging preparation can be developed. But unfortunately, most schools do not stop there for they require "accurate" numerical or literal estimates of the student's grasp of the material studied. School promotions, honors, and graduation are dependent upon such values. They insist upon grade records of recitations and such grades spell the defeat or success of the student.

In the great effort to maintain high standards of scholarship, many teachers make a practice of grading each student immediately after his recitation. This practice is unwise for the following reasons: (*a*) It places students of a certain emotional type under nervous tension during the recitation. Realizing that their every word is being carefully weighed to determine errors, they are guarded, reluctant to venture, reticent to express original ideas, nervous, and, in general, under undesirable stress. (*b*) Too much emphasis placed on grades causes a sacrifice of worthy objectives. Obviously the teacher's classbook is a constant temptation to him to force his students to work for grades. (*c*) A teacher must break into the sequence of the work to compute each grade, which forces him to divide attention between the computation and the conduct of his recitation. This is, indeed, a serious objection for, at best, it is most difficult satisfactorily to meet all of the exigencies of the recitation as they present themselves.

A more advisable plan is to grade the students after the recitation period has closed. With practice, the teacher can develop a skill of thinking over the reactions of each pupil and thus make the necessary records without any interference during the period. The records will be fully as accurate as when such estimates are determined in class.

II. TEACHER'S PREPARATION FOR THE RECITATION

The first step in the teacher's preparation for a recitation is a clear definition of the general aims of education as outlined in

Chap. II. Such knowledge becomes the basis for instruction, for these specific objectives and their various ramifications are fundamental. They define the problem and stake out the educative goals. They are so basic that a mastery of them and of their significance to teaching is equally important with the control of the subject matter, for they, in part at least, determine the choice of procedure.

It has been mentioned elsewhere that each course of study must defend its existence upon its contribution to the cause of socialization. Hence, another phase of the teacher's "remote" preparation is the careful analysis of his course, showing specifically how it links up with the aims of education in general. Such an analysis involves an exhaustive, studied treatment of the most painstaking sort. It cannot be accomplished by a cursory survey, but only by means of a complete outline of the topics of the course giving the functions of each in the attainment of the social objectives.

Following this idea further, each recitation must defend itself on the basis of its contribution to the attainment of the objectives set for the course. The teacher's immediate preparation, in addition to a mastery of the subject matter, involves the interpretation of the functional relationship of this subject matter to the types of modification to be made in the pupils. For illustration of the above, let us suppose that a course of study is designed to contribute abundantly to worthy home membership, worthy use of leisure time, command of fundamentals, and perhaps less directly to others. Each lesson in this course, if taught correctly, must be carefully analyzed by the teacher to determine the ways it may be made to function in the socializing process and then to develop a plan of attack to insure its effective use for this purpose.

It may be said, with little fear of contradiction, that, although experienced teachers need make less preparation than the inexperienced, they never reach the point where they have completely outgrown the necessity of it. In teaching it is indeed easy to slip into a rut, but constant revision of methods and new interpretations obviate this danger.

III. METHODS OF CONDUCTING RECITATIONS[1]

Four important methods of conducting a recitation will be considered. They are: (1) Socratic question method, (2) telling method, (3) topical method, and (4) written lesson. Each of these methods has a definite function to perform, and the technique of administering them will constitute part of the professional equipment of the teacher.

The teacher should have a clear understanding of the fact that few, if any, single recitations call for the use of one method to the exclusion of all others. In fact, it is not inconceivable to think of certain recitations which would call into use each of the various methods. The choice remains with the teacher; his judgment should be the guide in adapting methods to meet the needs of the work at hand. It may be neither wise nor unwise to use a variety of methods. The nature of the recitation materials and the immediate aims of the lesson will determine the policy.

1. **Socratic Question Type.**—This method is perhaps the oldest of all for it had its inception at the time of Socrates who first used it. Since its initiation as a teaching device, it has had almost constant use. Its universal application has been so long established that even teachers with no training at all turn naturally to it. But as a real agency in learning, a thorough understanding of its use is a necessity. As will be noted below, the question type is an instrument requiring technical skill in order to use it advantageously.

The question must stimulate thought or it is useless as a teaching instrument. Many teachers are cognizant of this fact but fail to understand that it should do more than stimulate only the one reciting, for, if such is the case, the time consumed by such a recitation is largely wasted by the rest of the group. True is it that some snatches of learning may be gleaned by those listening,

[1] No attempt will be made in this chapter to discuss the various types of recitation organizations such as the "socialized recitation." The writers have limited their discussion to the treatment of those general principles only which are applicable to all types of recitation organization. References are given, in the bibliography at the end of this chapter, for use of those interested in the various types of recitation organizations.

but they are so small that they may be classed as negligible. The question is not designed to bring out information for the edification of the group so much as it is to force mass mental reactions. If the greatest value of the question lay in the information conveyed by the reciting student, it would be far better for the teacher to give a series of lectures, for by so doing the information would be more accurate and much more highly organized.

Consequently, the question must be so framed and used that it will naturally stimulate the entire group to react. This interpretation makes its use more complex and intricate. Any one can ask questions but only the most highly trained can ask them effectively.

In addition to this, it must be so designed that it will eliminate the possibility of guessing, for such a practice defeats our purpose. Further, it should be so stated that the provision for oral expression is made in the answer. Still another feature is that the teacher must always attempt to ask questions, wherever practicable, which call for a coordination of all subjects with the one under consideration.

a. Elements of a Good Question.—Brevity.—When a teacher asks a question it must act as the stimulus for the direction of nerve impulses over specific synaptic connections. One that is well directed and definite acts as a selective agent to the choice of neural pathways, but one which is involved because of too many points to be considered throws the mind into a state of confusion. There follows a dispersion of these nerve impulses which makes their definite control impossible. It gives no well-defined point of focalization, which condition eliminates the possibility of the selection of the proper connections to be made.

A splendid illustration of the hopelessness of an involved question is given by Betts,[1]

> . . . A teacher who had not yet mastered the art of questioning asked his physiology class a question somewhat like this: "Do you consider it advisable, taking into account the fact that none of the vital processes go on as vigorously during sleep as during the waking hours (you remember that the breathing and the pulse are less rapid and the

[1] Betts, G. H., "The Recitation," p. 67. Quoted by permission of the Houghton Mifflin Company.

temperature of the body also lower) to eat just before retiring at night, especially if one is very tired and exhausted—a condition which still further lowers the vitality and hence decreases the powers of digestion and assimilation—and would your answer be different if it is understood that the food taken is to be light and easily digested?"

Precision.—Another way in which nerve energy may be diffused is to make the question indefinite, for when the meaning is not clear it may be directed along any number of channels unproductive of real learning. For example, the writer heard this question asked in a geography class, "What about the railroads in New York state?" It is easily seen that such a question can start the flow of thought into any number of different lines. In the first place the students might be actuated to think in terms of the various railroad systems operating in New York State. Or again they might be led by a different mind set to think in terms of railway terminals. In fact, such a question may cause almost any type of response which, by nature of the question, may be pertinent, but with reference to the teacher's aim, irrelevant. The question must be specific enough to shut off all avenues of thought except those which lead to the type of modification desired. The same objection may be made to all classes of questions which are ambiguous.

Questions in General Should Call for Application of Facts and Not Facts Alone.—Our objective in teaching, as has already been stated, is to direct students to use facts in the solution of life problems. It is possible to avoid a mere factual reproduction of textual material by framing the questions with a freedom from the use of the textbook as a basis for them. There are those teachers who teach with textbook in hand at all times. Regardless of how hard one might strive to abstain from using textual terminology it will creep in, when constant reference to the book is made. Obviously, if a teacher will limit his questions to the facts of the lesson and incorporate actual quotations from the book in such questions, the students will be forced to memorize the lesson content. On the other hand, if the teacher calls for the interpretation of these facts, the students will soon learn that memory work will not suffice and that they must put real thought into their preparation.

It is not to be understood that all forms of written or printed guides should be discarded by the teacher during a recitation. On the contrary, it is desirable that he use outlines or other agencies to insure direction and eliminate any possibility of rambling. A small notebook would suffice for this purpose. It is well to formulate a few of the important key questions beforehand.

b. Incorrect Types of Questions.—In common practice one finds a great dearth of effective questioning. This is true of experienced as well as inexperienced teachers. The teacher with an active class before him is assailed with many different stimuli which divide his attention, and unless he has carefully worked out at least the major ones, his questions in general are likely to suffer. Often the recitation will take a sudden turn of direction, legitimate in its nature but unexpected, which makes it necessary for the teacher to frame his questions on the spur of the moment. Unless he thoroughly understands the requirements of a good question and knows what incorrect types to avoid, he must necessarily fail in his efforts.

Direct Question.—Such a question is one which can be answered by yes or no. "Was Lindbergh's plane called the Spirit of St. Louis?" is typical of this type. Its failure as a teaching instrument needs little interpretation. The teacher has in reality done the thinking for the students, for usually, as if to make sure that he will not fail to understand the implication, his vocal intonation "points" the answer. It has the added disadvantage of providing a stimulus for guessing, for what child will fail to take a chance on the answer, even if in doubt as to the correct response?

Direct questions are very common in their appearance, for expert teachers sometimes resort to them when they have difficulty in getting an adequate response by means of more desirable types. But such practice is an evidence of inertia, for it is much easier actually to do the work for students than to lead them to do it themselves.

Alternative Question.—This question is framed in such a way that its answer becomes merely the choice between two situations stipulated in the question. An illustration of this type of ques-

tion is, "Is the whale a mammal, or a fish?" A statement in this form materially "simplifies" the students' thinking. The teacher asking this question might as well have said, "Now I realize that there are many different classifications of animals, the characteristics of which you know, but to make your work easier (soft pedagogy) I have eliminated all such classifications except two. So, which of the two that I have given you would you guess?" How different it would have been had the question been framed in this manner, "To what classification of animals does the whale belong?" Such a question would have forced the pupils to think through the characteristics of all the animal classifications, to arrive at the answer. Such a thorough thought process would give a real return in learning.

Pumping Question.—This type of question is in the form of an incomplete statement from which a key word or words have been omitted. "The area of a trapezoid is equal to ——?" is an example of this class. Its failure to meet the demands of a good question is obvious; it short circuits complete thought.

Leading Question.—Such a question as "Chlorine is a halogen, is it not?" belongs to this category. It has all the disadvantages of the incorrect questions already discussed, and in addition it offers a strong stimulus for guessing.

2. Topical Method.—This method calls for a recitation on topics rather than on mere isolated questions. It is at once obvious that some subjects lend themselves to its use with greater facility than others. The so-called content subjects, for example, are more suited to its use than are mathematics, grammar, modern languages, and others.

The topics may be in the form of interrogations but as such they are more comprehensive in their nature than are the questions used in the questioning method. This type of recitation, if skillfully conducted, has distinct advantages over the above method. Great care must be exercised, however, to keep the topics within the limit of the ability of the class, and sufficiently short to avoid any confusion due to the student's attempt to organize an elaborate discussion. With these safeguards, its

possible application is general throughout the elementary and secondary schools.

Continued use of topical discussion develops the ability to organize material, for the students are thrown on their own resources to select pertinent subject matter and reject irrelevant points called for in the topic. This is not true in the use of the question and answer method, for here the teacher assumes the leadership. By his questions he directs the selection of responses to be made, for indeed each reaction comes as a result of a stimulus question. Hence most, if not all, organization of the sequence and selection of reactions is done by the teacher. But such is not the case in the use of the topical method, for here the responsibility of organization is squarely up to the child.

A case in point will illustrate this advantage. The writer heard a recitation of the question and answer type in history on the exploration of Columbus. The sequence of questions asked by the teacher was as follows: "What prompted Columbus to set out?" "Where did he get his money?" "How many ships made the voyage?" "With what new instrument was his ship equipped?" Is it not clear from this group of four questions that the entire leadership was assumed by the teacher? The only responsibility the students had was to follow his lead—but not to lead themselves. Had a topic such as "Discuss the preliminary steps to Columbus' exploration" been given, there would have been a perfectly obvious shift of the responsibility.

A second great advantage of the topical method is its provision for the development of oral expression. It is, of course, true that this to a limited degree is possible with the question and answer method, but the simple question cannot provide the opportunities which the topic can, for its scope is too narrow.

It is not intended that the reader gain the impression that, because of its marked advantages, the topical method is the only valid recitation procedure. It may be well where possible to start off with the use of topics and then, as needs arise, revert to the use of the simple question. It will be found that students reciting topically make many omissions or perhaps their responses will include inaccuracies or misconceptions. These flaws require

supplementing, which can easily be given by resorting to the question as a means of making needed corrections.

The use of the topical method, with a class not accustomed to it, will be discouraging to the teacher, particularly at first. It will be found that the students will have great difficulty in responding to such "general" statements or questions. Only patience and training will remove this inability. The teacher will have to show the students time and time again exactly how to cope with topics, and slowly a skill will develop, operative in meeting the demands of the method.

3. **Telling Method.**—Many teachers make a practice of using the formal lecture to quite a great extent in the classroom. The very nature of learning points to the futility of such practice for it usually precludes self-activity. It is, of course, true that one can learn much from a lecture, but such learning is possible only after vigorous mental activity is experienced by the listener. If it were possible for one to stimulate each student to a maximum of self-activity during a lecture, such a device would have much value, but in actual practice it is known that such is not the case. In reality, and this is where many teachers are misled, the class may be very respectful, quiet, and to all outward appearances paying strict attention to the lecture, but not be learning from it. Their thought may be many miles from the classroom, yet through their attitude they give every indication of most active attention.

It is necessary to look to another source for the defense of the telling, or what has sometimes been called the "lecture" method. Notwithstanding what has been said, it is of real service to the learning process, if used judiciously, for by its use the teacher can supplement the material of the course and thereby greatly amplify it. Every efficient teacher will have a much broader grasp of the subject than that outlined in the syllabus requirements of the course. This enables him to enrich the material with an abundance of illustrations. The contribution of additional facts, processes, or experiences will, in addition to giving a richer interpretation, facilitate the clarifying of difficult and confusing situations.

In general, however, such amplifying is incidental, it being applied only as the occasion demands. For this reason, the process can in no way be classified as formal lecturing. With this point in mind and with the attempt to avoid any possibility of misleading the reader, the name "telling method" was chosen in preference to "lecture method."

4. The Written Lesson.—The ability to express oneself in writing must be part of the equipment of every successful individual, for all walks of life call for its use. It is each teacher's responsibility to contribute wherever possible to the attainment of this objective. Written as well as oral expression cannot be developed without much specific training, and thus the written lesson has a reasonable claim for consideration in the classroom.

There are some who confuse the aims of the written lesson with those of the written test but there is a clear functional distinction between them. The former aims at the development of written expression, while the latter is designed, as the name suggests, to test. The one is a learning device, while the other evaluates the adequacy of learning.

In actual use the oral recitation should predominate but not to the exclusion of the written lesson. It is advisable now and again to devote as much as a whole period to written work. Some teachers quite frequently "run in" a ten or fifteen-minute written lesson along with the oral work. No set form of procedure can be defined, but it is advisable to plan for some written work each week.

In addition to the major emphasis of training the students in written expression, there is another distinct advantage in its use from the viewpoint of effective learning. As was mentioned above, an ideal recitation will force a maximum of thought on the part of each child. Owing to the nature of the oral recitation this aim is indeed difficult to attain. But in the written lesson each child must react to each question and with a higher degree of concentration. In this way alone do we come nearest the attainment of maximum mass effort.

IV. GENERAL TECHNIQUES TO OBSERVE

There are certain miscellaneous procedures which if observed will give returns in a higher type of learning. There are certain elements of good form which could well be the "stock in trade" of every artistic teacher. It is not alone the observance of the big principles in teaching, that make for effective performance, but also a thorough grasp of those elements of the work which may seem to be of lesser importance. A school superintendent once said, "A good teacher will be master of all the big things but an artistic teacher is master of the little ones as well." His remark showed keen insight into the problems of teaching.

1. Techniques Which Tend to Stimulate Maximum Thinking.

a. Direct Questions to Class: If the teacher calls the name of a student before asking the question, that tends to shut off the mental activity on the part of the rest of the students. If, however, the question is asked first, then a pause before directing it to a student, such a practice keeps the whole class in an attitude of expectancy. No one knows where "lightning will strike," and thus the tendency is for each to get in a state of preparation by doing some thinking on the question.

b. Scatter Questions.—It is well to avoid calling upon students according to a systematic order, such as alphabetically or in sequence of seating. The reason for this is obvious for it provides a splendid resting period for those at one end of the alphabet while those at the other end are reciting. The same holds true for the use of any other uniform system the operation of which the students understand.

c. Not Repeating Questions.—Some teachers, because of a habit of repeating questions, are greatly responsible for much of the mental inactivity of the students. Once they understand that the question will be repeated without penalty for not having heard it, they will seldom "hear" the first time. If, however, the teacher makes sure that he has so spoken as to be thoroughly audible to all paying attention, and then treats all of those not knowing the question as cases of inattention, there will be little need for repetitions.

2. **Taking Stock of Oneself.**—A periodical self-analysis will prevent the formation of many peculiarities which become habitual after a short time. It is well for a teacher to stop to take a survey of his reactions as a teacher. Where was he standing, what was he doing when he stopped, and precisely what sort of a picture would he make to an observer just entering the room?

The writer, in the manner mentioned, stopped a cadet teacher in the practice field and had her make such an analysis of herself. She discovered that she was exhibiting an almost ridiculous scene for any disinterested spectator. Her feet were spread wide apart, in a most awkward attitude. She found that she was shouting at the top of her voice to a small class that could have heard a whisper. She held a small piece of chalk in her hand which she was whirling around in a nervous fashion. All of these mannerisms had slowly crystallized into habits, for she had never been checked on them, nor had she made a self-inventory.

Another cadet teacher observed by the writer had developed the habit of prefacing each question with "all right." This commendation was given each student whether or not the recitation deserved it. As soon as the student was through reciting, followed the customary "all right" and then the next question. Had this teacher practiced a little self-analysis while actually teaching she would have soon discovered this element of poor form.

Some teachers pace and prance up and down in front of a class and demonstrate other forms of nervous expression. Such activities set a class "on edge" and put it under unnecessary nervous tension. In such cases, again, the teacher, through a little self-analysis, might preserve the integrity of good form.

3. **Repeating Answers Breaks the Confidence of the Students' Ability in Self.**—There are teachers who can never let an answer made by a student pass on face value. They must change it even if only ever so slightly. To some students, this means that they are not capable of giving a good recitation and unconsciously they form just such an opinion of their ability. To others, the teacher's unwillingness to accept answers, even if correct, is discouraging and a stimulus for half-hearted effort.

4. **Coordination of Oral Recitations with Correctly Spoken English.**—Teachers often become so absorbed in their subjects that they forget their place in the education of youth. Except in the case of drill work where the technique calls for speed, the students' statements should be complete and made in well-formed sentences. Lack of clear enunciation, correct pronunciation, and clear thinking should not be tolerated.

5. **Use of Supplementary Textbooks.**—The use of many books gives the students a broader point of view of the material and will eliminate the danger of developing the erroneous notion that their subject is sealed between the two covers of their text. It has the further advantage of adding interest to the work under consideration, for if the material is presented in an uninteresting manner in one book, it may be better treated in another. It is also highly probable that certain topics may be treated by one author in a manner difficult to understand, while another may be very clear in his treatment. In general, it is very advantageous to use as many books in making assignments as the limitations of the library facilities will permit.

6. **Do Not Fill the Breach in Students' Recitations.**—A quite common practice is for teachers to rush in and do the reciting when students begin to falter in their response. This apparently saves time but it does so at the expense of self-activity. A good motto to observe is, "Never give to them what they can get for themselves." If a student is having trouble or fails completely, the teacher should throw the responsibility for a correct answer on the class. It is time enough for him to "tell" after the resources of the group have been exhausted, but not before. The teacher must be ever mindful of the fact that he is the "director of learning, and not the dispenser of knowledge."

Problems and Exercises

1. A teacher of elementary algebra made the practice of sending half of her class to the blackboard to work exercises during the class period while the other half remained at their seats "looking on." One problem was assigned at a time and because of individual differences some finished more quickly than others.

Disturbances were caused by those who were not otherwise occupied. What violations of good recitation technique did this teacher make and how could she overcome the difficulty?

2. If it is recognized that the objective in the recitation is to bring out the applications of facts. Does this mean that the teacher should never deal with minute details? Discuss.

3. A teacher was observed who permitted students to raise their hands if they knew the answers to the questions asked. The principal of the school objected to this practice on the basis that it led to confusion and disorder. The teacher's defence was that it stimulated a vigorous interest and enthusiasm which would be lost if the practice were discontinued. Giving reasons, state what your decision would be in such a case.

4. In a class in eighth-grade history two girls who were brilliant desired to do all of the reciting. They could answer any question the teacher might ask and sulked if not called upon. Their hands were always in the air and now and again they shouted out answers without being called upon. How could this great zeal and superior ability be utilized without interfering with the rights of others?

5. A high-school freshman in European history seemed unable to give a topical recitation, but could answer any single question the teacher might ask him. He was not diffident nor was he embarrassed before the group and his preparation was always carefully made. How may he be helped to respond with greater effectiveness?

6. A teacher discovered that some of her pupils were reticent to recite. They were unquestionably embarrassed and ill at ease upon being made to stand. Their lack of poise was not due to inadequate preparation. What should be done with these students?

7. Select a small unit of subject matter from some course of study and frame a set of thought-provoking questions on it, emphasizing the use of the material in the solution of life problems.

8. Observe the work of some classroom teacher and write a criticism of the questions asked.

9. In what ways can the broad cultural background of a teacher be made to serve as an asset in conducting a recitation?

10. What dangers confront the young teacher, who has a scholarly knowledge of his subject, during his first teaching experience in high school? What steps should he take to meet these problems?

References for Further Study

Betts, G. H., "The Recitations," Houghton Mifflin Company, 1911.

Colvin, S. S., "Introduction to High School Teaching," Chap. XV, The Macmillan Company, 1920.

Davis, S. E., "The Work of the Teacher," Chap. VII, The Macmillan Company, 1920.

——— "Self-improvement, A Study of Criticism for Teachers," Chaps. IX, XII, The Macmillan Company, 1927.

EARHART, LIDA, "Types of Teaching," Chap. IX, Houghton Mifflin Company, 1915.

MANGUN, VERNON L., "Texts in Classroom Management," *School and Society*, Vol. 20, pp. 599–601, Nov. 8, 1924.

MERICK, G. A., "Progressive Education," pp. 217–225, Houghton Mifflin Company, 1923.

MONROE, WALTER S., "Directing Learning in the High School," Chaps. XI, XVII, Doubleday, Page & Co., 1927.

MOSSMAN, LOIS COFFEY, "Changing Conceptions Relative to the Planning of Lessons," Teachers College Contributions to Education, No. 147, Bureau of Publications, Teachers College, Columbia University, 1924.

NUTT, H. W., "Supervision of Instruction," pp. 70–183, Houghton Mifflin Company, 1923.

PRINGLE, R. W., "Methods with Adolescents," Chap. III, D. C. Heath & Company, 1927.

ROBBINS, CHARLES L., "The Socialized Recitations," Allyn Bacon Company, 1920.

SEARS, J. B., "Classroom Organization and Control," Chap. XIV, Houghton Mifflin Company, 1920.

STRAYER, G. D., "Brief Course in Education," Chap. X, The Macmillan Company, 1920.

THAYER, V. T., "The Passing of the Recitation," Chap. XV, D. C. Heath & Company, 1928.

TURNER, AUSTIN H., "A Study of Achieving and Non-achieving High School Pupils," *The School Review*, Vol. 35, No. 4, p. 289, April, 1927.

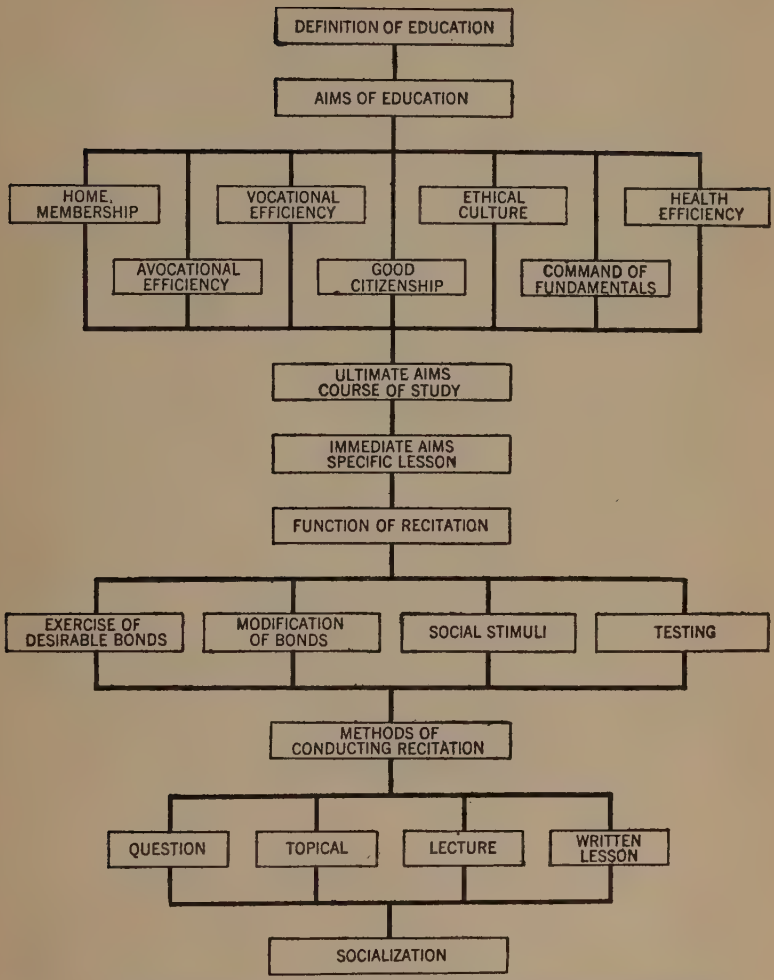

Fig. 14.—Graphical representation of the content of the chapter, The Recitation.

Chapter X

THE PROBLEM AS A TEACHING DEVICE

It is quite generally agreed that whenever educational work can be presented as a problem, that is, so that some sort of unit activity, recognizable at the beginning and continuing to have an appearance of "wholeness" as the worker moves along in the serial steps required, and having a purposeful end, the educative processes will be smooth and the results of most profit. There comes very near to being an inherent tendency in man to want to finish a piece of work that he has once begun in great earnest. This is because of the fact that, as a general thing, primitive man did most of his own tasks by himself and without division of labor. To realize the full effect of this impulse, consider the case where a few strains of music have been played and then the performer stops suddenly without reaching a natural pause. A drive flowing through the nerves of the listener has been cut off abruptly thereby causing annoyance. To overcome this, the listener is likely to try to finish the strain either audibly or in imagination. Again, who has not heard of the nervous roomer who waited for his thoughtless neighbor to throw the second shoe on the floor?

I. DEFINITION OF A PROBLEM

There is a wide range of opinion among writers as to what may be classed as a problem. Some seem to think that the simplest reaction to be acquired is a problem. Others are likely to go to the other extreme and think of problems and projects as only extremely complicated tasks which require considerable time to complete. It seems to the writers that we may safely limit our definition of a problem to those tasks which require purposeful thinking. In saying this we are not unmindful of the fact that nature seems to solve her problems without thought, and as man

is part of nature, some of his problems seem to be worked out by natural adaptation; and to a certain degree, probably, this is also true of the individual man. However, we are not here concerned with that kind of problem solving. Furthermore, we must keep in mind that there is a vast difference between daydreaming and thinking to an end. Thinking is instinctive and therefore automatic, but *what* we think is a matter of training and education.

Aristotle said that we never think until we get into trouble. By trouble he evidently did not have in mind the narrow meaning of the idea but was thinking of its larger phase. To him it meant the inability to do at once what he wished to do. Also, this is Dewey's idea as he illustrates it by several sorts of problems in the sixth chapter of "How We Think."

Probably there is no better definition of a problem than the condition which is spoken of by Doctor Kilpatrick as a "balked activity." This idea is general enough to include all sorts and phases of problems, practical and speculative, simple and difficult, natural and artificial, final and preliminary, empirical and scientific, and those of skill and information. It covers the conditions which exist when one does not know *what* to do either in whole or in part, and when one knows what to do but not how to do it, and when one knows what to do and how to do it but for lack of skill cannot do it.

Activity itself is a word of very wide range of meaning but it at least involves doing or action. Even *wanting* to do something is an activity. If this want is blocked we have a problem of getting started on the desired activity. Then when the activity is begun, it may be balked at any point in its prosecution. When this happens a problem has arisen. The following are illustrations of both great and small problems.

A child who has cut his finger wishes to play in the sand box, but the sand gets into the cut and hurts. Yet he may wish very much to play in the sand at this very time. If he begins to wonder how he can alleviate this annoyance and finally decides to put adhesive tape on the cut, he has solved a problem.

A reader may come upon the word "fetish" and not be familiar with its meaning. His activity, which is the reading understandingly of the paragraph, is balked. He must consult a

dictionary and get the solution. This is an informational problem.

A child may wish to say "incomprehensible," but finds that he cannot because the vocal organs do not have the proper correlated habits. He must make the necessary adjustments by training. This is a problem of skill.

A dentist may have a very simple piece of work to do on a child's tooth, but the fright of the child makes it impossible to do the work. He must find some way of reassuring and calming the child. This is a preliminary problem while the actual dental work is the final one. Or, a statesman may wish to outlaw war but finds opposition. He must then seek compromises which would reconcile the opposition.

II. THE NEED OF STANDARDIZED PROCEDURE

Ferando Sanford in his little book "How to Study Illustrated Through Physics," presents convincing evidence that there is a general scientific method of solving problems and that it is in reality the sole method by which scientific knowledge has been acquired. The fundamental steps of this method are shown to be: (1) the making of an hypothesis by induction; (2) the predicating of some result dependent upon the truth of the hypothesis; (3) the testing of our predications and thereby verifying the truth or falsity of the original hypothesis.

By analyses, Sanford shows how exactly Newton, Galileo, Pascal, Gilbert, and other scientists have followed the general scientific method.

Dewey, in "How We Think," analyzes the steps taken by himself in the solution of a number of different kinds of problems. Chapter VI of that book should be read at this point. Both Sanford and Dewey use the case-method analysis. Kilpatrick, in his lectures, and possibly in some of his writings, gives us the general method of problem solving. Perhaps we should say that the three agree in all important particulars.

Furthermore, these analyses do not represent arm-chair speculation. They are the results of pragmatic study. They are not what their authors think ought to be the process of think-

ing or problem solving; they are statements of what actually has been accomplished in all thinking worthy of the name of thought. Moreover, they may be seen to correlate nicely with the laws of learning. The writers believe that Doctor Kilpatrick has made a most acceptable philosophic analysis of problem solving in its application to learning and teaching. An interpretation of his procedure and conclusions follows.

III. FORMAL STEPS

1. **A Problem Arises.**—As before said, whenever any ongoing activity gets balked a problem has arisen and something must be done before the activity may be fully resumed. This gives cause for annoyance and makes us ready to do something about it.

2. **Search for Promising Elements.**—A complex of native traits, such as curiosity and a tendency to manipulate unusual things plus whatever we have learned of problem-solving method, causes us, when confronted with a problem, to investigate the situation in the hope of finding what is wrong. This inquiry may range from mere ignorant groping to the highest type of scientific research. But whatever the method, the end is to find some element or elements in the situation which give promise of relief or solution. There may be one or more, even many, such promising elements. Some may be easily seen, others not so easily seen. Some may appear to be certain solutions but later turn out as false leads. Intelligence will be an important factor in our ability to see a great variety of promising elements, but it is not everything.

3. **Selection of Pertinent Elements.**—The next step is to select from whatever variety of promising elements have been discovered some one element which seems to offer the best solution in view of all other things concerned. That is, it should be the best from such standpoints as practicability, time, energy, and expense commensurate with the importance of the given activity. This step also involves the law of readiness and as we approach the finality of the decision or choice, a greater or lesser degree of

mind set to a definite end occurs. At least a tentative choice has then been made.

4. **Adaptations.**—The selection made, it now becomes necessary to adjust the situation by whatever adaptations become apparently necessary. Such adaptation is very likely to require a certain degree of skilled manipulation. If the operator has the required skill readjustments may be quickly and easily made. But if he lacks skill it may become necessary to acquire it before proceeding farther. In such cases the present task is likely to suffer. This step involves the law of exercise.

5. **Testing Results.**—Obviously, when the adjustments decided upon have been made, the next step is to test their efficiency. The test is usually nothing more than one or more trials to get the activity going again. It may or may not involve an appreciable time element. The test of a surgical operation would require time, while testing a spark plug would require but a few seconds. Furthermore, it will be readily seen that at least two things are in reality being tested, the soundness of the thinking done in making the selection, and the skill used in making the adjustments. Of course, it is taken for granted that in many problems a variety of tests or verifications may be needed before it is wise "to pick up the tools and prepare to resume the activity."

6. **Resumption of Activity.**—The final step, so far as this particular activity is concerned, is to resume the activity in so far as possible, and proceed to the end in mind before the problem arose, utilizing, to the best of our ability, whatever profits or adjusting whatever losses that the problem may have entailed.

Consequent upon the last two steps will come the operation of the law of effect, because a degree either of satisfaction or of annoyance will result depending respectively upon the success or failure of the tests. Let it also be noted that our thinking may break down at any point in the whole process. This may occur because of lack of information, or because of lack of skill to perform the reactions which we have decided should be made. For either of these reasons our thinking will be unsuccessful and

failure at any point puts us back at least to the last successful step, thus resulting in going around in circles. In the last analysis such circle thinking is usually at the bottom of all worry.

Now, assuming that a problem has been very successfully solved, what has been learned? At least three things. First, the actual readjustment, that is, the actual doing of the set task; second, more or less information concerning the materials, implements, etc.; and third, certain attitudes will have been acquired or strengthened.

Suppose, for example, a boy has been set the problem of building a morris chair. When the chair is finished it must be admitted that he has accomplished the first task, *viz.*, that of making some sort of chair. Also, he will certainly have learned more or less about the wood which he has used, its hardness, grain, and other qualities, and likewise something of the tools which he has used. Lastly, he is almost certain to have built up some favorable or unfavorable attitudes toward such work. If the chair pleases him and the work thereon has gone well, the attitude is likely to be favorable toward doing more and better work along this line. Such favorable attitudes are often spoken of as the psychology of success. On the other hand, if the work has been disagreeable and the chair is not well received by those whose comments mean most to the boy, the attendant attitudes will most likely be adverse. This is a case of the psychology of failure.

Now what are the relative imports of these three kinds of learning? Is it not easy to see that a knowledge of materials and tools will serve us in many and more important situations than will the ability to make a chair? Likewise, it is clear that the attitude that one is a success will lead to ever widening circles of useful activity, while failure and its attendant attitudes is reasonably certain to lead toward inferiority complexes, or worse yet, to psychological compensation adjustments by which one tries to cover up failure by tricks of imagination, boasting, projecting the blame on someone else, rationalization, or some other form of self-defense for having been thwarted.

It will be in place here to point out that if a problem, no matter how excellent in itself, be set for a pupil whose mental age

is too low for that given problem, whether it be because of youth or because of low intelligence, the most probable result will be failure with the attendant evil effects of failure. On the other hand, if the task is beneath the ability of the child, his own dislike of it, coupled with the social force of disapproval or perhaps ridicule, is almost certain to lead to psychological maladjustments. Problems used in educating the young should somehow be "attuned" in difficulty commensurate with the child's abilities, both physical and mental.

It is probably perfectly evident that problems vary in the degree to which the processes which they involve may be directed. This variation is probably very much the same as that between the degree of informational and of skill knowledge required. In a purely informational problem the direction may proceed so far as to become dictation of the solution. But where skill is required direction can go very little, if any, beyond illustration of the reactions to be made.

However, in a technical sense, there probably is no learning except learning of skills. When one is told the definition of "fetish" there probably must be muscular reaction, at least "inner speech"; that is, a slight functioning of the vocal organs or there is no learning. This means that all learning is registered in muscular reactions and if the learning is completed to the point where it can be recalled or "re-performed," then muscular habits have been formed.

Illustrations will make clear the technique of problem solving which has been suggested above. Three specific problems are presented; one a teacher problem and the other two pupil problems. To show the wide range of application the pupil problems will be one of a mechanical and the other of an academic type.

IV. FIRST ILLUSTRATION—TEACHER PROBLEM

1. The Problem Arises.—A teacher of typewriting discovered that several of her best pupils had struck a plateau in their learning. Such a predicament is very common to teachers who watch the performance of individual members of their classes. She noted that over a period of several days in the case of these

students there was no improvement. She put more energy into her teaching, gave individual assistance to these students, and, in fact, in every way redoubled her efforts to bring them out of the plateau. But these improved teacher activities in no way accelerated the pupil's learning. This is a clear case of a teacher meeting a balked activity. She faced a very real problem.

2. **Search for Promising Elements.**—Cognizant of the science of problem solving, she began to search for reasons. Her training had taught her that among the common causes for such plateaus are lack of readiness, interference bonds, that is, the practice of incorrect bonds, and the necessity of developing a hierarchy of habits. Here then she had a rather rich variety of sources which held out promise of relief or solution.

3. **Selection of Pertinent Elements.**—There was no way offhand to determine to which of these probable causes the difficulty was due. Hence she resorted to the process of elimination. Her first procedure was to investigate the conditions that might occasion the lack of readiness. Among those that she recognized as possible contributary elements were excessive participation in extra-curricular and social activities, seasonal conditions such as "spring fever," improper environmental conditions, such as light, heat, noises, and other distractions, health disturbances, and emotional instability. Careful checks and tests proved that these were erroneous hypotheses. There was no discoverable lack of readiness.

She next made studious observations to ascertain the presence of interference bonds. Her study revealed, however, that there was nothing incorrect in the manipulation of the fingers or the operation of the machines. The students were not "practicing in error."

Having found this, too, to be a false lead, a third selection of probable cause was made. The difficulty seemed to be some natural correlative of learning. Of this variety of difficulties she chose the one that is almost universal in all types of learning, namely, inadequate realignment and reorganization that must take place at certain stages in order to fuse the separate move-

ments into a hierarchy of habit. Working upon this hypothesis she found that the students had mastered the essential elemental habits, such as proper key touch, spacing, and carriage shift, but had not coordinated them into a smoothly operating series of reactions which would lead to productive typing. In other words, they had not formed the habits necessary to connect the several operations involved as a whole into facile unit performance.

4. **Adaptations.**—Having diagnosed the difficulty she prescribed the remedial practice, namely, exercises which greatly emphasized drill upon the coordinating movements of the operation. Phenomenal improvement followed. The necessary readjustments had been made.

5. **Testing Results.**—She next tested the permanency of this improvement under all sorts of situations and on all varieties of material so far learned. Thus she had verified her thinking and her treatment up to this point.

6. **Resumption of Activity.**—Her problem was solved and the students resumed the activity so long balked, with a normal rate of progress.

V. SECOND ILLUSTRATION—PUPIL PROBLEM (MECHANICAL)

1. **The Problem Arises.**—A seventh-grade teacher in a small, poorly equipped school was attempting to show the effect of the Rocky Mountain range on the rainfall in the plains to the east of the mountains. She found difficulty in getting the students to interpret elevations from the plain maps they were using; no relief maps were available. She casually mentioned to the class that there were maps that had the mountains and river systems molded in proportion to their elevations and depressions. The students were at once interested and wondered why such a map was not part of the school equipment. The teacher then requested the purchase of one but was denied as the budget had not provided for any additional instructional materials that year. The students needed a relief map for further study but none was available; the activity was balked—they faced a problem.

The teacher found that a relief map could be constructed easily by molding a paste, made from the proper proportions of flour, salt, and water, on to a cardboard background upon which had been traced the outline of the country to be represented. In addition to solving the problem here was a splendid opportunity to introduce a purposeful unit of instruction. The case was presented to the pupils and they eagerly took up the project.

2. **Search for Promising Elements.**—The class brought various types of cardboard and experimented to determine which seemed best suited to use as a base for the map. The necessary data as to variations in altitude were collected. They considered the size of the map and whether or not it should be one of the United States as a whole or a section thereof. Such questions as representing river systems arose. They tested the advisability of inking out state boundaries and other phases that would enter into the construction of such a map.

3. **Selection of Pertinent Elements.**—Heavy, rough cardboard was discovered to be the most satisfactory type for use. It was found that since some little skill was needed in the molding process only the highest ranges could be included. Foothills were eliminated. In order to place the elevations in the proper proportions they decided upon an approximate scale. The size chosen was three feet square. The section west of the Mississippi alone was selected and only the most important river systems were chosen. It was found that if the plastic material were allowed to harden sufficiently it would "take" ink and so they decided to mark out the states.

4. **Adaptations.**—The proper selection of elements now being complete, the class proceeded to make the necessary adaptations. Each student provided himself with the proper materials and with all of the elements to be included carefully outlined, set to work on the task. In due time each had produced his own relief map with varying degrees of effectiveness.

5. **Testing Results.**—The maps were then checked against the facts and those that were found to be in error were readjusted to better represent topographical conditions.

6. **Resumption of Activity.**—Using the best maps as a basis, the activity of considering the rainfall east of the Rockies was again resumed.

VI. THIRD ILLUSTRATION—PUPIL PROBLEM (ACADEMIC)

1. **The Problem Arises.**—It will be fitting to follow the problem of rainfall projected by the teacher mentioned in the second illustration to show how she applied problem solving technique to its solution. The fact that the rainfall in the mountains of southern Colorado is from twenty to thirty inches while at the base and east of the mountains it is only ten inches, and then continues to decrease as one progresses eastward, caused the class to pause. At first no explanation was apparent. The pupil activity was balked.

2. **Search for Promising Elements.**—In the search for promising elements such matters as prevailing winds, causes for the condensation of water vapor, effect of bodies of water on the moisture of the air, the effect of arid regions on air, effects of temperature on air, and the like were considered. The students were sent to many different sources to determine the data. Their attention was called to such common phenomena as the condensation of water vapor in a room on the window pane when the temperature lowers, and the production of convection currents in the heating system of a home.

3. **Selection of Pertinent Elements.**—From careful consideration of the promising elements it was found that the prevailing winds passed from water to land. It had been concluded that as air passes over large bodies of water it absorbs water vapor. Large altitudes were noted to have lower temperatures than plains. Warm air was found to have a greater capacity to hold water vapor than cold air.

4. **Adaptations.**—The class concluded that the warm winds in passing over the Pacific ocean eastward became laden with water vapor, but because of the warm temperature there could be no precipitation. But as they reached the Rockies they were

forced up the side of the mountains over the high altitudes in progressing eastward. Hence, as they progressed upward they cooled and therefore lost capacity to hold the water vapor. This brought about a precipitation. But in continuing downward on the east side of the mountains they again became warm with a corresponding increase in the capacity to hold the vapor. This accounted for the decrease in the amount of precipitation at the base of the mountains and the continued decrease eastward.

5. **Testing Results.**—The conclusions made were checked by using the Sierra Nevadas which are even more pronounced in their effects than are the Rockies. It was found that precisely the same conditions were produced by this range and the problem was thus considered solved.

6. **Resumption of Activity.**—The class continued by considering the effects of such phenomena on the occupations of the people of the localities in question.

Problems and Exercises

1. A teacher of seventh-grade civics just previous to general election assigned the following problem in this manner: "For tomorrow I want you to assume that you are chairman of the county committee of one of the political parties. Three weeks from today is election. Work out a plan for getting out the vote." This is all the data the teacher gave the students. The results were unsatisfactory. Criticize.

2. State two problems in your major subject and in outline form give the type of procedure you would use in solving these problems in the classroom.

3. In what ways does a scientific method of problem solving provide for the operation of the laws of learning?

4. A teacher of elementary algebra reports the case of a student who could perform any of the algebraic operations with a high degree of accuracy, but he could not interpret the significance of a problem. He seemed at a total loss of how to proceed. He was a willing worker and was of normal intelligence. How would you meet this condition?

5. Give an illustration drawn from your subject of each of the various types of problems suggested in this chapter.

6. Criticize the statement, "The use of the problem method in the classroom is too time consuming."

7. A teacher of European history made abundant use of the problem method of instruction. He encountered the case of a boy who would jump to conclusions and usually his decisions were erroneous. The rest of the class were careful to weigh all elements of the situation as they had been trained in problem-solving technique. How would you proceed with this boy?

8. What reasons can you give for the motivating power of a well-directed problem?

9. What are some of the ultimate aims we should consider in training students in problem solving?

10. Suggest criteria you would use in selecting problems to, (*a*) keep them within the capacities of the students and (*b*) determine their worth to the learning process.

References for Further Study

Clem, Orlie M., "A Work Book Syllabus in Principles of Education," Warwick and York, Inc., 1928.

Dewey, John, "How We Think," D. C. Heath & Company, 1910.

Douglass, H. R., "Modern Methods in High School Teaching," Chap. X, Houghton Mifflin Company 1926.

Bagley, William C., "The Educative Process," Chaps. VIII, XIX, The Macmillan Company, 1922.

Colvin, S. S., "An Introduction to High School Teaching," Chap. XIII, The Macmillan Company, 1920.

Gates, Arthur I., "Psychology for Students of Education," Chap. XIV, The Macmillan Company, 1924.

Holley, Charles E., "The Teacher's Technique," pp. 126–134, The Century Company, 1924.

James, William, "Psychology," Chap. XV, XVI, Henry Holt & Company, 1913.

Kilpatrick, W. H., "Foundations of Method," Chaps. XIV, XV, The Macmillan Company, 1925.

Parker, Samuel C., "Methods of Teaching in High Schools," Chap. XIX, Ginn & Company, 1920.

Robinson, James H., "The Mind in the Making," Chap. VI, Harper & Brothers, 1921.

Strayer, G. D., "A Brief Course in the Teaching Process," Chap. VI, The Macmillan Company, 1920.

Strayer, G. D., and N. Norsworthy, "How to Teach," Chap. VII, The Macmillan Company, 1920.

Thorndike, Edward L., "Educational Psychology," p. 214, Teachers College Bureau of Publications, 1921.

Waples, Douglas, "Procedures in High School Teaching," Chap. XV, The Macmillan Company, 1925.

Wilson, H. B., G. C. Kyte, and H. G. Lull, "Modern Methods in Teaching," Chap. VII, Silver, Burdette and Company, 1924.

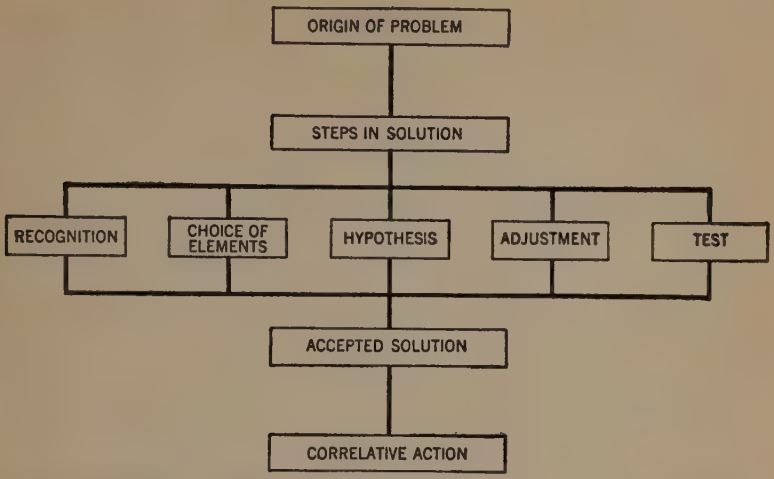

Fig. 15.—Graphical representation of the content of the chapter, The Problem as a Teaching Device.

Chapter XI

THE APPRECIATION LESSON

I. THE MEANING OF APPRECIATION

There seems to be a direct ratio between the individual's status of culture and his number of "satisfiable" desirable needs. Each successively lower stage in the scale of refinement has fewer worthy purposes and lofty desires. The boor demands from life the satisfaction of those desires only which are sensuous and base in nature. He does not feel the need of art, literature, music, and drama, for the appeals of such are far above his crude interests. He is not inspired by lofty ideals, thrilled with the infinite beauties of life, nor has he a passion to improve himself, for such capacities are found only in those who have been touched with the purging fire of refinement.

One can exist quite happily without the more delicate appeals of life in its most refined sense. That which one has never experienced, obviously, does not become an essential. This must not be interpreted as meaning that an interest in the finer things of life should not *become* essential. Richness and fullness of life demand the best civilization has to offer. We may draw an analogy to illustrate the manner in which needs become established, realizing that our illustration does not exactly fit the conditions under discussion for in it we are dealing with material things only. If one has never owned a car its convenience is never missed, but to those who have adjusted their living to one, it is a tremendous hardship not to possess one. True, life without a car is not impossible, but with one life becomes richer and fuller because of the advantages it offers.

In like manner if one has never tasted of the joys of art, literature, music, drama, and the other sources of more refined pleasures, he never knows what he has missed. But once these new vistas of life are opened to him, further exploration in them

becomes a necessity. Also, the further this exploratory process continues the more firmly rooted does the need for its continuance become. If life is worth living, it is worth living well.

For abundant living the individual must have refined tastes. These can be developed by training and it, therefore, falls to the public school to supply this training. It is, of course, true that the "schooled" individual is not necessarily cultured for we find many such who are boorish despite their educational advantages. Also, we find, on the other hand, a great number of individuals with little schooling who are the last word in refinement and culture. This does not discredit the statement that the public schools should function in developing refined tastes. On the contrary, it presents a challenge to redouble the efforts to improve teaching techniques in order to produce increasingly greater returns in refined tastes.

When an individual responds emotionally to a situation involving affective values which operate only on refined tastes, it may be said that this individual has a worthy appreciation for that situation. This definition of appreciation must necessarily presuppose an intellectual understanding of these affective values. Furthermore, for real appreciation there must be present in the total situation some elements which synchronize with the feelings of the individual in such a way that he is "tuned in" in harmony with the emotional setting the total situation purports to establish. The ability to appreciate thus involves more than just the enjoyment or even the mere intellectual understanding of values. It must include actual *participation* in emotional situations which lead to the desirable emotional responses. An illustration will make this interpretation clear.

One may hear a musical selection and enjoy its rhythm and harmony. For complete appreciation, however, there must be some understanding of values and the ability to interpret the theme. The listener must actually, through his imagination, place himself in the same or a similar emotional condition the composer was in when he wrote the selection. Thus, he must experience the same or similar feelings the composer had; he must atune his feelings with the emotional elements of the selection.

He must synchronize his feelings with the emotional stimuli of the selection. This is appreciation.

II. THE NEED FOR TRAINING APPRECIATIONS

Much of character is made during leisure. As soon as the pressure of economic demands is released, individuals will react to whatever stimuli make the strongest appeals. If leisure time is expended profitably it adds to the richness and fullness of life, but if it is dissipated on undesirable pursuits it leaves the stamp of such indulgence upon the character. Idleness is not only wasteful but dangerous as well, for base interests creep in during the absence of higher motives. Even the minds of the most highly trained should during spare time be occupied with lofty conceptions, for there is a natural tendency to revert to lower interests when such are not crowded out with higher motives.

There is in our civilization an ever increasing amount of leisure due to our machine-controlled production and our modern, time-saving devices in business. Not so many years ago twelve hours a day for six days a week was the time devoted by an individual to business and industrial work. With the rapid development of machinery this was reduced to ten hours for the same number of working days a week. Next came the eight-hour day with Saturday a half holiday. Today there is much talk about the five-day working week and we do not know what the future holds.

Without considering the economic advantages or disadvantages of this shortening of the working period, it must be conceded that to the individual it offers great promise or perhaps an equally great menace. If society is trained to utilize this free time profitably, it is a boon to life, but if not, it will inevitably take its toll in misspent activity. Here is the challenge! The schools, obviously, cannot dictate how their graduates shall use their leisure time, but they can and indeed must so train the tastes of students that the attainment of lofty objectives becomes a passion. They must develop an intense hunger for securing "the best that has been known and said in the world."[1] This is the obligation of the school if it hopes to develop that social objective

[1] MATTHEW ARNOLD.

which in Chap. II we have chosen to call "worthy use of leisure time."

Important as the training of the appreciations is, the schools are doing little to develop them. One great reason for this is the lack of well-defined technique of a tangible nature which can be worked into specific methods of instruction. The factors conditioning learning of this type are so variable that but few generalizations can be formulated. When we deal with the feelings of an individual we are exploring an uncertain field. Pupils can be directed by coercion or otherwise to learn facts, principles, or processes; to solve problems; to develop habits, skills, or rote associations, but not so with appreciations. To insist that a child be inspired by lofty conceptions or be thrilled by beauty is ridiculous. Feelings are produced only by indirect and somewhat roundabout methods. Much is accomplished by suggestion and by the ability of the teacher to act. This is what makes the process difficult, for so much depends upon the ability of the teacher. He should, in the first place, have a deep sense of appreciation himself and, in the second place, he must transmit this emotional condition to his students.

III. TYPES OF APPRECIATION

The notion that only subjects in the field of art lend themselves to the development of appreciation is erroneous. Considering the term in its broadest sense makes it easy for us to conceive of any subject being the basis of such teaching. It is a fact that practically all subjects contain material of various types which can be made to appeal, in one form or another, to the feelings. The field of application is limitless but it requires insight and versatility to make the adaptations. Each course of study must be carefully scrutinized for all such opportunities, and when they present themselves the proper techniques should be applied to bring out the emotional objectives.

In general there are among others two important classes of appreciations which may be developed, aesthetic and social. The former includes the emotional responses to the beautiful and the latter to the ideals of human relationships.

1. **Aesthetic Appreciation.**—To this class belong those situations which are fundamentally artistic and inspiring in appeal. Such subjects as music, nature study on its art sides, art, literature, drama furnish the bases for these appeals. Any material which emphasizes refined tastes, lofty ideals, beauty, and inspiration furnishes the basis for the teaching of this type of appreciation.

Although the so-called fine arts and literature lend themselves most definitely to the teaching of aesthetic appreciation, it must not be construed that they are the sole sources. In all fields of learning we find opportunities for teaching appreciation. The writer observed a physics teacher who drove home an inspiring conception in a simple but forceful manner from the subject matter of physics.

The class had been studying the contraction and expansion of water under varying conditions of heat. The teacher drew a diagram of the cross-section of a stream of water to illustrate his description of how it "froze over." He then pointed out that the upper layers of water cooled, contracted, and hence their density increased which caused them to sink thus exposing warmer layers. These in like manner cooled and similarly sank. This process continued until the entire stream had reached the temperature of 4° Centigrade. He then explained that the next drop in temperature, which would be below four degrees, instead of causing further contraction would effect a slight expansion and, by so doing, would decrease the density of the upper layers which would result in their remaining on top of the warmer layers instead of sinking as usual. At each successive stage in the lowering of the temperature the upper layers expanded more. Finally when zero Centigrade was reached ice formed and because of its smaller density remained on top of the stream. He showed that should the contraction process continue when the temperature reached zero the stream would freeze from the bottom upward. By skillful questioning he made the class see that such a condition would mean an extermination of aquatic life. He then told the class that water was one of the very few liquids that reacted in this way; almost all of the others contracting until solidification. He then added the master stroke by asking

one question which he permitted to remain unanswered. It was, "Does this not seem to indicate that the universe was planned?" He immediately went on with other work and the effect was electrical.

This illustration, in addition to bringing out the fact that subjects other than those recognized as belonging to the field of art can be used for developing aesthetic appreciation, serves another purpose as well. It indicates that appreciation can be taught without the use of a formal appreciation lesson. It must, of course, be carefully planned but many a lofty concept can be established by incidental treatment. In many cases a word or two, or mere gesture from the teacher, if carefully directed, is sufficient to arouse a deep emotional response. There are some cases, however, where specific appreciation lessons must be taught. The choice of method or procedure rests with the teacher.

2. **Social Appreciation.**—The acquisition of social appreciation is a potent force in the development of good citizenship, patriotic behavior, and ethical character. All of that learning material which emphasizes human relationships, sacrificial service, and other forms of desirable personal conduct supplies the situations for the development of such appreciation. The problem is to utilize this material in such a way that children will react to these stimuli with deep feeling, for when this is done their experiences lead to correct emotional training. Three general types of social appreciation will be discussed separately.

a. Sympathetic Appreciation of Contemporary Peoples.—Social interdependence is advancing apace with the forward movement of our social system. In fact the latter seems to some extent to be determined by the former. Thus our progress must be quite largely conditioned by the whole-hearted cooperation of all types of individuals making up our social fabric. It is, of course, true that there are many levels and classes of people, judging them from an intellectual and economic point of view. This must necessarily be true. But it is, also, a fact that each class is an integral part of our democratic system, performing specific and worthy functions. The ditch digger is needed as

well as the physician, the iron moulder as well as the construction engineer, the bricklayer as well as the college professor. Therefore, what an absurdity for those in higher walks of life to "look down" upon those in lowly stations! Such contemptuous snobbery is not only ludicrous but apallingly dangerous, for it has the same effect as "biting the hand that feeds us." It introduces unnecessary friction in our social machinery and slows up its operation. There must be an increasing effort to teach a sympathetic appreciation of these people regardless of social, racial, or intellectual differences.

Such an appreciation is indeed more than tolerance; it is tolerance tempered with heart-felt interest. The goal is the establishment of a feeling of brotherhood. But how far we are at present from this ideal! It is questionable if, as yet, we have even mere tolerance, to say nothing of such a brotherhood. "But," you say, "is not such an objective too idealistic for attainment?" The answer is "Yes,—in its entirety." However, it is not impossible to conceive of making some inroads toward its partial attainment. The difficulty has been that little or no attempt has been made in the past to emphasize this phase of social appreciation. True, but little constructive work can be accomplished with adults along this line, but the schools can do much to build up gradually in the minds of youth the correct type of feelings toward contemporary people.

b. Patriotic Behavior.—Through the agency of social appreciation good citizenship and patriotism can be effectively taught. History and literature are replete with accounts of the suffering of those individuals who made our modern society and American democracy possible. If we can but instill a sense of gratitude in the minds of youth for all the advantages these men and women have wrought for them, better American citizens must necessarily result. One of the "signs of the times," and one not particularly wholesome, is that the American public is inclined to take conditions for granted. We are living in a great materialistic age and there is danger that individualism may become rampant at the expense of our social system. What is needed is to imbue our boys and girls with a stewardship idea, that they may be impelled to "carry on" from the place where the former

generation laid down the burden. This can be done through developing a responsibility for social improvement which in turn can be stimulated, in part at least, by developing a deep feeling of gratitude for conditions as they are.

Looking at the problem from this broad stewardship point of view, we at once see the extensive ramifications of such a phase of social appreciation. In addition to literature and history mentioned above, we find that practically every subject in any school curriculum offers abundant sources for such training. An ingenious teacher will seize upon such opportunities and capitalize them for developing the correct emotional responses.

c. Ethical Character.—A third phase of social appreciation is the development of ethical character. The lives of men and women are of great influence in the establishment of character. Boys and girls are constantly placing themselves in the position of their heroes. To live these lives vicariously in this way leads to an assimilation of some of the characteristics of the individuals imitated. Vicarious experiences are actual experiences calling for the exercise of highly motivated bonds. The only danger is that if children are unguided in their choice of heroes to worship, those having undesirable characteristics may and most probably will be chosen.

Romantic, active individuals are usually the idols of young people. Men and women who do things in a daring, energetic way make the strongest appeals. Thus we have all gradations of individuals from the most degraded criminal to the most highly desirable character who may be a potent influence in a child's life. A train robber, murderer, and gunman, is romantic and indeed highly active and thus may be the hero of some, but are Lindbergh, Commander Byrd, Foch, Columbus, and countless others less romantic? Our problem is to give the children worthy characters to exemplify and imitate in the attempt to satisfy that craving for idealization so strong in boys and girls. The teacher must always remember, however, that in order to get students to respect his choice, he must select in accordance with their needs.

IV. TEACHING SUGGESTIONS

1. Development of Readiness.—The development of readiness in the appreciation exercise is not less important than in every other type of learning. Hayward[1] feels that the appreciation lesson is important enough to dignify it with the term "Red Letter Lesson." Since the desire is to stimulate an intense emotional response, the mind set must be carefully established, for deep feeling is at best difficult to control. Any agencies which will advertise the exercise in such a way as to establish the correct emotional set toward it should be used.

An eighth-grade teacher taught an appreciation lesson on J. D. McCrae's "In Flanders Field" in conjunction with her course in American history. The lesson was artistically taught and it resulted in making a most stirring appeal. The students were deeply moved, so effective was her method of attack. Much discussion followed, which the teacher so manipulated that it was brought around to a consideration of whether or not the appeal made by the slain soldiers was answered. There was general agreement that the comrades of the dead heroes did not "break faith" with them. The teacher then said, "America answered the challenge. R. W. Lillard has written a poem he calls 'America's Answer' which expresses in a delightful and stirring manner the sentiment of American people. Would you be interested in such a poem?" Great enthusiasm was expressed and the teacher agreed to "read" this poem to them on a certain specified day. The "reading" consisted of a most carefully prepared lesson of appreciation on "America's Answer." The class awaited with great enthusiasm the arrival of the day when the gem was to be given them. The poem was greatly advertised and the students were placed in a state of readiness for the lesson.

2. Developing an Apperceptive Basis.—An intellectual understanding of the material used as a basis for developing appreciation is a necessary prerequisite. This condition is in no way novel for in every type of learning the new must be explained in terms of the old. But its great fundamental importance in the training of emotional responses merits its special consideration.

[1] HAYWARD, F. H., "The Lesson in Appreciation."

As we shall see later, the student must actually live through, either in reality or imaginatively, those emotional experiences which the appreciation situation is designed to effect. Consequently, the elements of the situation must not be foreign to those life contacts made in one way or another by the student. How, for example, could one live through the experiences of a "sweat shop" worker if he knows nothing of such industrial conditions? Without such information to build on, a sympathetic appreciation of such workers is impossible.

An acquaintance of the writer had an experience which offers a splendid illustration of the value of an intellectual background to appreciation. This individual relates that a splendid copy of Millet's "The Haymaker" had hung in his home all during his childhood days. He subsequently received it as part of a legacy, but since he had never cared for it particularly, he was not especially enthusiastic over possessing it. It was, however, one of his father's favorite pictures and for this reason alone he gave it a place among his other pictures. This was done with no little reluctance, for he saw no beauty in it. He tells that one evening a friend who was calling upon him commented with enthusiasm on the excellency of the reproduction. The caller, who had a good understanding of art and artists, launched out into a discussion of Millet. He told about his early life, his shortcomings, and aptitudes. Among other things he explained how Millet was intimately associated with peasant life and that his great masterpieces portrayed that type of life. He elaborated on the environmental conditions of this class of peasantry, emphasizing their mode of living, the way they carried on their work, their ideals, and customs. Unwittingly he laid for the owner of the picture the foundation for its appreciation. This owner related to the writer that after his caller had left he studied "The Haymaker." In place of the homely ill-fitting garments which he had previously seen, he saw the exact representation of peasant costume. In place of the unattractive face he found the serious but happy and contented visage of one so typical of this class. He began to speculate on the life of this figure and in fact found himself living her life in his imagination! He was moved to deep feeling; the beauty which he had never before noticed unfolded itself to him.

Now in addition to "The Haymaker," prints of others of Millet's works adorn his walls and he treasures them among his choice possessions.

In general, nothing should be introduced at the time of the lesson which will in any way detract from the emotional appeals desired. There is little to stimulate deep feelings about the explanation of a mythological reference to poetry, or any other phase of explanatory emphasis. It is well to introduce this in an incidental manner long before it is needed. This requires skill which comes through experience for it necessitates the planning of opportunities for such instruction incidentally in conjunction with other types of work. The effort should be to equip students with all necessary information such that no treatment of any of the elements of the situation is necessary during the appreciation exercise. The entire emphasis during the lesson should be directed on attainment of the desirable emotional responses.

3. **Training in Vicarious Living Necessary.**—A work of art, a literary gem, or a musical selection is that manifestation of the inspiring themes conceived by the originator. For a deep sense of appreciation the individual must be atuned to the emotional responses of the artist. To "tune in" on the producer's feelings one must actually live through, in his imagination, some of the actual life situations of the producer. The depth of the appreciation depends upon the degree to which this vicarious living can be accomplished.

Two of the writer's students conducted an appreciation lesson on the "Moonlight Sonata" by Beethoven. They placed the major emphasis upon getting the class to appreciate the composer's moods and emotional reactions during his composing. One of the students chose to perform at the piano and the other "lectured" on the interpretation.

The lesson was started off by giving the class some idea of the life of Beethoven. Much stress was placed upon his unhappiness and his never-ending struggle of life. His poverty, his deafness, and his unfortunate love affairs were mentioned, giving sufficient background for a deeper understanding of his great sonata. After giving some time to the establishment of such a back-

ground the "lecturer" directed his attention to the interpretation of the sonata. The story he related is, to music lovers, a popular and well-known narrative which is supposed to relate Beethoven's inspiration for the writing of the sonata. It is probably an incorrect version but is indeed stirring to the feelings.

The story told was that one moonlight night Beethoven in great restlessness wandered aimlessly about the streets of Vienna. After some time he came to a quiet street where out of one of the houses came the strains of one of his own compositions, played with intense feeling and marvelous interpretation. He listened a moment, then looked in through the window and saw a young and beautiful girl playing this heavy selection from memory. He knocked at the door, was admitted, and upon meeting the girl found that she was totally blind.

Deeply touched he stepped to the piano and started playing the greatest of all of his improvisations, the "Moonlight Sonata." At the moment the student told this, his companion who sat at the piano started to play it with much feeling. As the selection was being played the "lecturer" explained (a product of his imagination) the moods of the composer. The reason for the great pathos of the first movement was attributed to the sadness of the composer which was described with vividness. Then in the second movement, the composer's spirits are supposed to have revived and he becomes absorbed with the invigorating thoughts of the joy of living, happiness triumphs over sadness, and the music becomes brilliant and lyrical. But in the third movement we again find those overpowering elements of sadness crowding out those of joy and the music again becomes tragic.

The two students who worked this out carried us right into the heart of the great master. We were living his very thoughts, our pulse quickened with his, his joy was our joy, and his sadness was ours. We lived the life of the great master and experienced his inspiration. Our feelings were synchronized with those of Beethoven; we were made to appreciate this great selection.

The same principles hold true in the development of social appreciation, only there it is a case of living the lives of the characters portrayed. It is less difficult than in establishing aesthetic appreciation, for in the latter the emotional responses of

the artist must be learned by implication, while in the former the actual life situations are carefully defined in full.

Problems and Exercises

1. A teacher in third-year high-school English after teaching a lesson in appreciation conducted a recitation calling upon students to express their feelings aroused by the literary gem. Some responded freely but others were hesitant. Discuss her technique.

2. The art supervisor of one system stated that in each grade above the third she strove to give a picture study of each of at least forty pictures, while a supervisor from another school system said that she used but two pictures in the same grade. The latter supervisor said it was more profitable to stress drawing as a means of developing appreciation. Which of the two school systems was doing more to develop art appreciation and why?

3. A grade teacher attempted to teach an appreciation lesson on "The Lady of the Lake" by presenting it to the class in the following manner: She had various students read a few verses at a time and then called for a discussion of what was read. She gave any explanatory information needed to make the meaning clear. She frequently asked the class to select the elements of beauty. This process continued for several daily periods. Criticize her technique.

4. A student of education asked this question, "In teaching an appreciation lesson in American history should the teacher, in order to develop the appreciation of America's heroes and outstanding figures, omit what is undesirable in their lives and tell only of the admirable characteristics? Would this not give a false picture of American history?" Discuss this question.

5. Select a unit of subject matter from any course of study and show how this may serve as the basis of teaching a lesson in appreciation.

6. Indicate the relationships which exist between the teaching of appreciation and the development of profitable use of leisure time.

7. Some authorities designate "sense of humor" as a type of appreciation to be developed. To what class of appreciation mentioned in this chapter could this be assigned? Why?

8. Hayward suggests that the first reading of a literary gem to a class should be by the teacher. What advantages accrue from such a practice?

9. A teacher in high-school American history was attempting to use the life of Washington as the basis of teaching social appreciation. He was in the midst of a discussion of his finest characteristics when he was interrupted by a boy's hand waving violently. The student who was recognized by the teacher proceeded to enlighten the class on some of this great leader's traits which were not so desirable. How would you treat such a case? Should we teach all the facts about our heroes in American history?

10. A student in high-school English feigned an attitude of appreciation during such a lesson merely to please the teacher, while in reality he was experiencing no emotional reaction. The teacher being suspicious that such was the case dis-

cussed the matter with him and he admitted the truth. What are the probable causes for this student's attitude and how may the difficulty be remedied?

References for Further Study

EARHART, LIDA B., "Types of Teaching," Chap. X, Houghton Mifflin Company, 1915.

FOSTER, HERBERT H., "Principles of Teaching in Secondary Education," Chap. X, Charles Schribner's Sons, 1921.

HOLLEY, CHARLES E., "The Teachers' Technique," Chap. IX, The Century Company, 1924.

MILLS, WILLIAM A., and HARRIETT H. MILLS, "The Teaching of High School Subjects," Chap. III, The Century Company, 1925.

MORRISON, HENRY C., "The Practice of Teaching in the Secondary School," Chap. XVIII, The University of Chicago Press, 1926.

PARKER, D. C., "Methods of Teaching in High Schools," Chap. X, Ginn & Company, 1920.

PARKER, S. C., "General Methods of Teaching in Elementary Schools," Chap. VII, Ginn & Company, 1922.

STORMZAND, MARTIN J., "Progressive Methods of Teaching," Chap. VI, Houghton, Mifflin Company, 1924.

STRAYER, GEORGE D., "A Brief Course in the Teaching Process," Chap. VII, The Macmillan Company, 1920.

———, and NAOMI NORSWORTHY, "How to Teach," Chap. VIII, The Macmillan Company, 1920.

THOMAS, F. W., "Principles and Techniques of Teaching," Chap. X, Houghton Mifflin Company, 1927.

WILSON, HARRY B., GEORGE C. KYTE, and H. G. LULL, "Modern Methods of Teaching," Chap. IX, Silver, Burdette & Company, 1924.

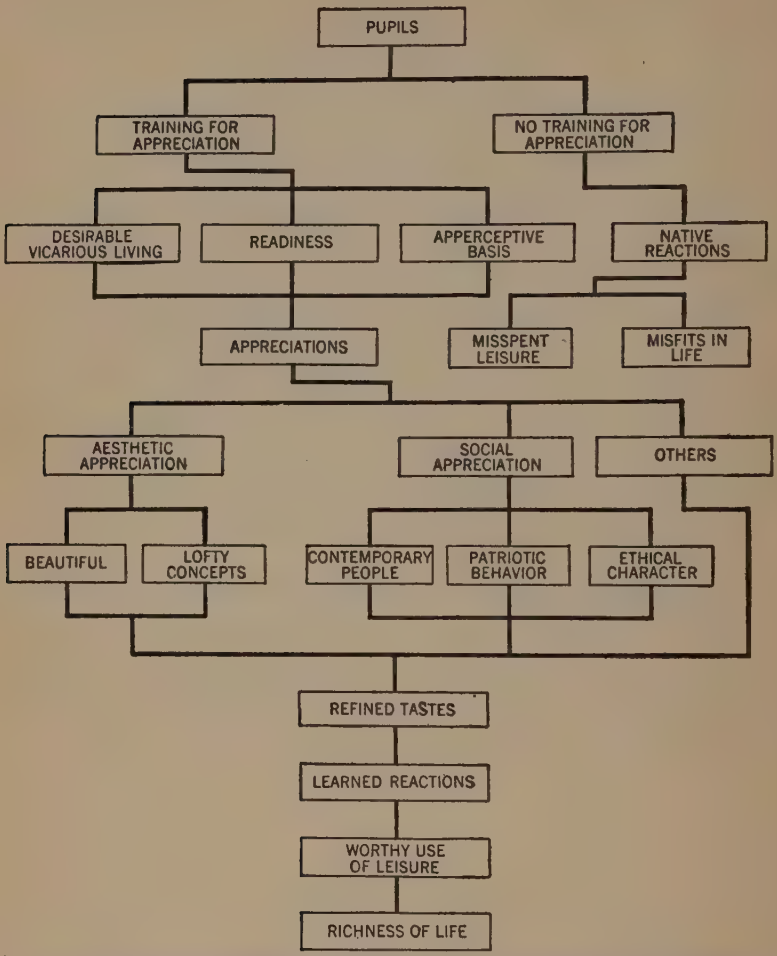

Fig. 16.—Graphical representation of the content of the chapter, The Appreciation Lesson.

Chapter XII

THE DRILL LESSON

I. IMPORTANCE OF AUTOMATIC CONTROL TO LEARNING

The principal function of drill is the development of automatic action. The term "drill" has been in the past and to some extent still is the cause for much confusion among teachers. This is because of the failure to grasp its technical implications. We still find those who "drill" for the final examinations, others who "drill" on the essential facts of the previous lesson preparatory to taking up the new, and still others who "drill" on all facts, principles, and processes regardless of the outcome this educative material was purported to meet. In fact, too generally, teachers assign the term "drill" to all procedures utilizing any form of repetition regardless of the ends sought.

In modern educational practice the term "drill" has a technical meaning which is specifically limited in its application. Its realm includes all of those procedures which, as was mentioned above, lead to the automatic control of those phases of mental activity that can be most economically utilized without active thinking. The drill lesson is of tremendous import to the educational development of children. It makes possible a release from conscious direction of those responses which can, with efficacy, be controlled by automatic action. This frees the mind for active thinking on such matters as require reflective thought. It eliminates what would otherwise be a "congestion" of the thought processes by clearing the path of mental activity of those responses the control of which can, with effectiveness, be shifted to lower levels and out of the bounds of consciousness. It is through the process of drill that this conservation of thought energy is effected.

A single illustration will make clear how indispensable to learning is the automatic control of certain activities. The process

of handwriting has as its function the written expression of thought. Experts in its teaching agree that the skill is not completely learned until it has become purely automatic and they develop their methods on this basis. Suppose for example, the response was not involuntary, every stroke of the pen, the spelling of each word, the formation of each letter, the handling of the pen, the position of the paper, the posture of the writer, and, in fact, every detail would require conscious direction. What happens in such a case is that the mind becomes so deeply involved with the control of unessential details that the thought which the writer is attempting to express is crowded out.

On the other hand, how simple writing really is to one who has mastered its technique. All mechanical details are very efficiently directed outside the consciousness of the performer which provides for the possibility of maximum higher thinking. Thoughts naturally flow freely and can be expressed as rapidly as the limitations of muscular movement will permit. This condition is illustrative of the efficacy of automatic control in learning. It is an indispensable equipment to all who would achieve what the higher forms of learning have to offer.

II. DRILL OUTCOMES: HABITS, SKILLS, AND ROTE ASSOCIATIONS

There are some who would designate all automatic acts as habits, but a closer refinement of the term is necessary. Habits in themselves may or may not be of value to learning, depending upon the contribution they make. The use of the fingers or other types of motorization in learning to add indeed become firmly fixed as habits, but they inhibit rather than facilitate the process. Such habits, and others equally harmful, which are not infrequently found in the reactions of students are not conducive to efficient mastery and yet they are habits resulting from instruction.

Our teaching objective is the development of those habits only which lead to some educative product. When habits can in this way be harnessed to meet the exigencies of learning we have more than a mere habit, we have a skill. Thomas[1] says, "Skill

[1] THOMAS, F. W., "Principles and Techniques of Teaching," Quoted by permission of the Houghton Mifflin Company.

adds to habits an element of judgment and conscious direction, so that only those reactions are stimulated which are useful for a desired end." A child may develop habits of making down strokes, up strokes, ovals, reverse ovals, and the like in handwriting but when these habits are all coordinated to the conscious end of utilizing them in the writing of words we have a skill. The habits are useful and must be learned but they are elemental in their nature. A skill is a fusion of habits into a coordination operating toward the achievement of a desired goal.

It is at once clear that the terms habits and skills do not cover all learned automatic responses. There is another type which is built up on the basis of association known as rote association. The memorizing of poetry belongs to this class. Definite words or ideas learned in sequence unlock others in such a way that their reproduction is effected without conscious effort. It differs from habits and skills in that it involves the automatic control of a content built up on the basis of association.

III. APPLICATION OF LAWS OF LEARNING TO DRILL TECHNIQUE

The drill lesson, because of its peculiar requirements, is naturally taxing to the students. The continued repetition that is necessary to make the response automatic is likely to act as an inhibition to interest. The freshness of studying new material or of practicing new activities, with the attendant interest that accrues from doing something different, soon fades if practiced with monotonous repetition. Children may be thrilled over the beauties of "The Lady of the Lake" as they read it the first time, but, unless proper safeguards are taken to prevent, memorizing passages from it brings into play all of the distasteful effects of unscientifically directed commitment. Under such conditions any degree of appreciation that may have been secured is undone. But on the other hand, such memorizing can be so directed that it will make for better understanding and a more deep seated and lasting appreciation.

The problems of an efficiently conducted drill lesson are linked with the successful operation of the laws of learning. We have seen that all learning must take place through their proper use and in the establishment of any form of automatic control we

indeed have no exception. In fact, the teacher should exert such great care in the use of these laws that he will be able to defend each phase of his drill technique on the basis of them as a determinant. So, one purpose of this chapter will be to interpret some of the important phases of drill technique in terms of the laws of readiness, exercise, and effect.

1. Establishing a State of Readiness.—The wide variation in the scope of the different habits, skills, and rote associations to be developed in the classroom eliminates the possibility of outlining a specific policy operative with invariability. All that can be done in a work of this sort is to point out some methods or devices which have a more-or-less general application. To include any of the suggested methods without the necessary modifications to fit them to meet the demands of the lesson at hand is indeed unwise. Nor is it to be understood that all methods have been included. It is the teacher's obligation to experiment and by such experimentation determine what in his case are the best possible devices. An original method which works is far better than the blind use of one which is recommended but the efficacy of which is in doubt.

The fact must constantly be kept in mind that any device used to establish readiness must be used only as a *means* and not as an end in itself. When too much emphasis is placed on the device it becomes an inhibitive force offering serious distractions which result in confusing the issue. No device should be so unrelated to the activity it is designed to stimulate that its connection is far fetched, remote, or absurd. Constant stress on the drill outcome is needed in the use of all agencies so as to remove the possibility of misplaced emphasis and the establishment of improper goals.

Among others, the use of games suggested below is a device to develop readiness. This "trick of the trade" is indeed bordering on, if it is not in reality, a purely artificial method. In its use perhaps the greatest care must be exerted to keep the real objective in mind. In the use of competition, also suggested below, the same meticulous pains must be taken. Much just criticism has been leveled at some of the commonly used methods because of the undesirable attitudes resulting from their injudicious appli-

cation. Any good device can be misused with its attendant evil effects. We must never lose sight of the fact that any method of creating readiness is in itself valueless and that its worth to learning lies solely in its use to facilitate the attainment of some specific drill outcome.

a. Readiness through Developing a Felt Need.—In the discussion of the assignment, use of establishing a felt need was mentioned as a possible way of developing readiness for the study of assigned material. It has further application for the same purpose in the drill lesson. Tremendous effort is no obstacle in the way of achievement, if by this effort children are accomplishing something of which they feel the need.

In business it is known that any commodity for which there is no demand is not marketable. The first duty of a salesman is to attempt to establish a need for his article long before he tries to close a deal. If this need is made to appear pressing enough, all objections to its purchase fade away. Similarly, if we in the classroom desire to "sell" some drill outcome to the students we must, if it is not already there, create an urgent need for it. Some illustrations of how this may be accomplished in the classroom follow.

A teacher of plane geometry had difficulty getting his students to memorize the statements of the proposition theorems. He found that no little effort was placed on memorizing the, mathematical development, a practice which he tried to combat but no attention was given the mastery of the statements. To meet this situation he gave a five-minute, written lesson each day, calling for the verbatim reproduction of the statements. At first, naturally, the students failed wretchedly for which failure they were penalized heavily from a disciplinary as well as from a scholastic point of view. This practice was continued until the class felt a real need for drill on this phase of the work. They were indeed "ready" for it because the lack of this type of knowledge led to difficulties. The drill periods which followed were motivated.

Another case in point is that of a teacher of chemistry who desired to have his students memorize a certain group of commonly used atomic weights. One day he assigned a great number of problems requiring their use, stating that the necessary

weights could be found in a table in the back of the text book. Since this table was inconveniently located, much time was consumed by the students in its use, a condition he was sure would occur when the assignment was made. The next day he mentioned to the class that they would be in almost constant need of certain of these weights and asked them if they would like a list of those most frequently used so that they might memorize them. Their previous experience was conclusive proof to them that time and energy could be saved by memorizing this material so they were eager to secure the list. The memory work was made "painless" for it became purposive; it had direction, and was not merely foisted upon the class without apparent motive.

b. Readiness through Competition.—The judicious use of competition has great potency in developing readiness but its injudicious application is pernicious. It was shown in another chapter that there is a great spread of intelligence in the average class. Usually there are a few individuals who are highly endowed with great capacities for intellectual work, while, on the other hand, we have a few with subnormal capacity, with the greatest number falling between these two extremes approaching one or the other. It is at once obvious that in an open competition between individuals certain of these are, by native endowment, destined to win while others, for the same reason, must inevitably lose.

A serious danger lurks in such competition where one child is pitted against another, for it makes way for the harmful effects of the psychology of failure. The child who is told he can win, and is encouraged to try, but because of his native equipment cannot possibly do so is ever striving to attain goals he is doomed to miss. Soon he develops the attitude that he cannot succeed in any endeavor, which belief spreads in ever-widening circles far beyond the scope of classroom activities, even to those within his power to accomplish. An inferiority complex is likely to follow this distorted damaging notion, which acts as an overpowering obstacle to circumscribe his endeavors.

The need is to charge individuals with the psychology of success. They must be given tasks which they can accomplish

with a high degree of success in order that they may thrill with the victory. They should develop a habit of success in order to be urged forward to greater achievement. Because of this, competition among individuals where the results are likely to stigmatize some of the contestants is dangerous, and should be avoided.

There are, however, two general types of competitive activity which have all the advantages and strengths of individual competition but which completely obviate all of its evils. In the first place there is that type of *group* competition where individual endeavor becomes a component part of the activity of the whole. The writer observed the use of this method in a sixth-grade class in arithmetic. Each row of children was designated as a competitive unit in a certain type of arithmetic drill work. The individual scores in each row were averaged to determine the record for the entire unit. In this way, no one person was singled out as the means of defeating the unit in the case of those groups which were not successful. Yet each one felt that he was an integral part, contributing to the success or failure of the unit, which acted as a spur to greater accomplishments.

Another application of this same type of competition is that between two rooms. A case in point is the hotly contested competition between a fourth and a fifth grade, the goal of which was the highest percentage of words spelled correctly during the week. Here again no one person stood out as the hero, boosting the score to the winning point, or as the stumbling block, causing failure, for individual records were buried in the aggregate class score. And yet who can say that this was not real competition? It led to a most highly developed state of readiness, for the spelling interest during the period of this competition period was feverish. It must be added parenthetically that this device as in the case of any other will, with excessive use, wear itself out and should thus be discarded long before such a condition sets in. A teacher must develop a keen perception of when to change his devices and be versatile enough to have new ones ready for immediate use as the occasion demands.

Records of group achievements posted on the bulletin board, or some other conspicuous place, add greatly to the value of such

competition. It is well to construct this record on a cumulative basis, for then it is made to show the actual progress from time to time. This sort of a statistical record provides a drive for continued improvement. It is usually desirable to appoint temporary monitors to do the figuring and make the entries to bring the record up to date, as it tends in a small way toward a coordination of the other work with arithmetic. Monitors may be changed each time a record is made and in this way the responsibility will be distributed.

The second type of legitimate and effective competition we will consider is individual in its nature. It is the competition of the student with his own record. This gives each child bright, dull, or indifferent, an equal opportunity to "win," for even the least endowed can improve with application. It will be found that very often the record of improvement of the mediocre students will far surpass that of those intellectually superior. It is not undesirable to have this happen. Mediocrity seldom has a chance to excel in life but here is one way in which the less fortunate children may have the opportunity to thrill with the exhilaration of real victory. A whispered word of sincere commendation from the teacher brings into play a powerful application of the law of effect.

For the successful operation of this device it is well for the students to keep records of their achievements. This, also, may be of a cumulative nature and show the results of periodic tests. The graph offers a splendid means of recording the results, for it gives a picture of the improvement. This gives practice in the construction and use of a valuable statistical instrument as well.

c. Readiness through a Time Control.—When one knows that he has just a limited time in which to perform a certain task, it definitely enlivens those synaptic connections pertinent to the task and deadens those that are irrelevant. A watch in the hand of a teacher which is used to time a certain specific performance stimulates a high degree of concentration. The ordinary watch, or better yet, the stop watch acts like magic in making students ready for drill work.

An iilustration of the use of this device was furnished by a teacher in French who was drilling her class on the mastery of a vocabulary. She explained that they would have five minutes in which to learn as many French words, with their English equivalents, as possible. The students started to work promptly and stopped on the second when the time expired. The moment she said, "Go" one could actually "feel" the concentration of the class. The results were tested in written form. This type of activity appeals strongly to students and its application in its various modifications is almost limitless.

d. Readiness through Games.—The instinct of play demands expression in boys and girls of all ages. The capitalization of this in drill offers an intense appeal of a desirable sort. There is a danger, however, as was mentioned above, if it is overemphasized, for we do not want children to get the idea that school work is play. Nor do we want them to develop the attitude that they should be paid in entertainment for work which the school has a legitimate right to expect. Thus, games to be used with harmless effect should be the occasional, not the regular, practice. Some teachers strategically use games as a reward for honest endeavor and by so doing they come as a privilege which the students have earned, rather than as a right which is their unqualified due.

The use of games for the development of readiness is almost unlimited in its scope. Any resourceful teacher can originate games of all descriptions which are attractive and thus interesting. There are almost numberless varieties, for example, on the principle of the old fashioned "spelling bee," which are applicable in many types of grade and high-school classroom drill. Ingenious teachers make excellent use of such games as baseball, football, track meets, and the like, where sides are chosen by respective captains, and scores are reckoned in terms of successful educational endeavor. Time limits are kept in the case of those games requiring them, such as football and others.

It is obvious, of course, that with older and more sophisticated students, care should be exercised to make no appeals which to them are ridiculous. The game idea should be adjusted to meet the ages, interests, and development of the students.

2. Use of the Law of Exercise in Drill.—Thorndike says,[1]

> The law of habit is supposed to be that "practice makes perfect," or that the nervous system "grows to the modes in which it is exercised." But practice without zeal with equal comfort at success and failure—does *not* make perfect, and the nervous system grows *away* from the modes in which it is *exercised with resulting discomfort.*

We have already discussed the necessity of providing for zeal in the drill work in our discussion of the development of readiness.

It is now our purpose to consider the necessary technique, to be observed in exercise, which will assure the correct operation of the law of effect by providing for successful achievement.

a. Clear Focalization of Task Necessary for Proper Exercise.—In developing any habit or skill the student must clearly and definitely focalize the activity which is to become automatic. This can be well illustrated from handwriting. Since in this process the objective is to produce an automatic motor response, the problem centers around the production of an adequate coordination of muscular movements. The child must have a clear conception of exactly what type of movement he is to make before he can practice for its automatic control. When this is accomplished, a clear focalization acts as a selective agent sorting out those neural paths which lead to the desired response from those that lead to a diffusion of nervous energy. It enlivens those connections that are productive and deadens those that are unproductive. To facilitate this, the teacher must set the example and actually show the learner, time and again, specifically how the movement is made before he attempts it. He must set a good copy,[2] not of the completed product but of the movements leading to its successful accomplishment, which the children seek to imitate by the method of trial and success.

The same principle obtains for the formation of any habit, skill, or rote association; the student must have a clear understanding of what he is to drill upon. He should not only have a vivid impression of what outcome is to result from the drill, but he must, in

[1] Thorndike, E. L., "Educational Psychology," Vol. II, p. 22. Quoted by permission of the Bureau of Publications, Teachers College, Columbia University.

[2] For further discussion of the use of "copy," see Colvin, S. S., "Introduction to High School Teaching," p. 193.

addition, clearly focalize his attention on all of the elements of practice leading to its attainment. The successful dramatic coach sets an exact copy of the type of activity he wants his caste to perform automatically and thus focalizes its attention on the habit or skill as it is to be practiced in its process of formation. The teacher of a modern language sets an exact copy of pronunciation to facilitate the focalization upon the elements of correct speech in this language. The teacher of English sets a perfect copy of spoken English to focalize his students' attention upon the processes involved in correct speech. The skillful football coach focalizes his students on the correct movements to be made by setting an exact copy of them. Once it is clear to students what particular results they are to secure and what the necessary steps are to their attainment, the proper direction of the nervous discharges controlling these activities are selected with facility, for such accurate focalization restricts the scope of the trial and success method.

The students' attention should be focalized only on desirable activities and rarely if ever should the teacher indicate, as is often done, undesirable responses to be avoided. An illustration will make this obvious. It is the experience of almost every person learning to drive a car that the uprights on a bridge seem frightfully narrow as he approaches it. There are few new drivers, if any, who do not feel a quickening of the heart beat as they approach nearer and nearer the bridge. If some one were to shout, "Look out for that left hand upright," just as the novice was about to cross such a bridge, the chances are good that the driver would head directly for it. The possibilities are equally great that during exercise the direction of the students' attention to incorrect habits not to be formed will lead to the formation of those very ones. Thus, to start students on the road to successful drill outcomes we must carefully focalize their attention on desired responses only.

b. Correct Bonds Only Must Be Exercised.—Closely allied to clear focalization is the problem of assurance against the exercise of undesirable bonds. It is as easy to form an incorrect habit as it is a correct one if the wrong response is exercised. The writer observed the case of a teacher who required a child to write

"persevere" fifty times after school for failure to spell it correctly during the spelling lesson. The pupil did his task faithfully, during the time the teacher was writing a letter. He did, however, get away to a bad start for he began by spelling it "presevere." The error was repeated the number of times required by the teacher, with the effect of establishing a habit of the incorrect spelling of the word. In all forms of drill work the teacher should safeguard a correct start and then carefully supervise it to prevent the creeping in of inaccuracies which would otherwise be practiced until learned. That such errors do creep in is an established fact. One reason for their occurrence is a flagging of attention, as we will see later on in this chapter quoting from Thorndike. A constant check is needed to reduce the practice of such errors to the minimum.

c. Active Attention a Necessary Element to Exercise.—Repetition without attention constitutes a wasteful expenditure of energy, for automatic control cannot result from such practice. A telephone number, for example, may be called repeatedly, without attention applied to its mastery, with the result that it must be sought each time in the directory. If the person sets out to learn the number, however, relatively few calls will "fix" it in his mind. A person may frequently use a certain book for reference in the course of a week without establishing the ability to recall its color. By directing his attention to learning this physical characteristic, however, he can with a mere glance strengthen the bond sufficiently for immediate recall at any time. These are a few examples of the almost infinite number that could be cited to show that the attention must be actively directed toward learning, if the repetition is to result in automatic control.

It may be mentioned in this connection that the commonly used method of "concert recitation" is quite likely to fail because it often permits of repetition with inattention. A good illustration came to the writer's attention as he was visiting a first-grade class. The teacher had a list of words on the blackboard, for the recognition of which she was drilling by the concert method. One little youngster in the back of the room was very intent on a volley-ball game in progress on the school playground.

He was, therefore, not looking at the board at any time during the drill period yet he never failed to contribute his share of the response, but only after he had received his cue from the rest of the class. The whole drill period was wasted for him, for, naturally, he could not give one correct response when called upon individually. It is quite usual to find in concert work that one or two voices appear first with the rest following as "seconds to the motion."

Reference to the curve of learning[1] will show that there are lapses in learning at which points no improvement takes place. These points of "no improvement" have been called "plateaus." They may occur from day to day or for greater lengths of time and may last for weeks or even months. It was at one time thought that plateaus were necessary as they occurred so generally among students in all types of learning material. In practically all of the recent investigations which have yielded objective evidence of a scientific nature, this has been disproved. They are not necessary and are in fact harmful as well as wasteful to learning.

Thorndike says,[2]

> The causes of the plateau, if it occurs, are then, according to Book, (1) the attainment of a "critical stage" in learning "where lapses in attention and effort occur," and (2) "practice in error" or the formation of bonds counting zero or negatively toward improvement.
>
> At these "critical stages" one of three things will occur:
>
> 1. The learner may be caught unawares by the lapse in attention and effort and continue to work as carefully as usual, but more and more lazily until a habit of working lazily is fastened upon him. In this case there will be further perfection of the habits involved in the writing (typewriting) at that stage, provided mistakes are avoided. But the learner fails to push himself on to a higher plane of writing and continues to work lazily until his interest in the work has been permanently dulled by the almost imperceptible improvement.

[1] For detailed discussion of curve of learning, see THORNDIKE, E. L., "Educational Psychology," Vol. II, Chap. 7.

[2] THORNDIKE, E. L., "Educational Psychology," Vol. II, p. 288, after Book. Quoted by permission of the Bureau of Publications, Teachers College, Columbia University.

2. There is more apt to go with the lapse in spontaneous attention and effort a growing carelessness and indifference towards the work, which, when later the lack of improvement brings a spur to energy, leads to a reckless application of attention and effort and to practice in error with a consequent "breakdown" in the learning. The learner rashly tries to make up for the lapse in spontaneous attention by greater effort, but neglects to give careful attention to the details, which only prolongs his plateau.

3. The learner may successfully deal with the special difficulties which the case presents, conquer every tendency to lag by the application of vigorous and well directed voluntary effort, and so carefully control his attention that the "critical stage" will be passed without a break in the continuity of his progress.

This quotation indicates the necessity of active attention; for first, it shows that no learning takes place during lapses of attention and secondly, that such lapses may lead to the exercise of incorrect bonds. The curve of learning is an individual matter and does not represent the progress of the group. For this reason the teacher must be alert to study the achievement records of each individual child during practice in the effort to determine the occurrence of plateaus as soon as they appear. Such vigilance can be developed only through the agency of a thorough understanding of the psychology of drill which cannot be given here, and through tireless efforts of building up a technique of interpreting individual differences.

The teacher can aid materially in preventing plateaus, and in the rescue of students from them once they have occurred, by planning his methodology in such a way as to maintain active interest and attention. The use of a great variety of agencies of strong appeal is the means by which this can be accomplished. No agency should be used over long periods of time but, rather, new ones should be interjected before the old methods wear themselves out. Appealing methods to establish readiness are, as we have mentioned, a prime necessity, but not less in importance is the use of a rich variety of procedures of exercise. The alert teacher will not be at a loss for such an assortment of drill devices, for he will be constantly inventing his own which will become part of his teaching equipment.

It is not to be understood that a flagging of attention is the only source of plateaus in learning. There are indeed many others. A detailed account of these is given by Gates.[1] We have not discussed these for a consideration of them does not fit in with our plan of attack on the problem of drill, and space will not permit their elaborate analysis in a book such as this.[2]

d. Length of the Drill Period Should Be Short.—There are so many variables in native equipment and in the demands of the various types of drill outcomes that, as yet, one cannot speak with authority on the length of the drill period most suitable for the development of any specified objective. In light of that dearth of experimental data, all that can be offered is a reasonable guess. Gates says,[3] "The facts vary somewhat with the functions and with the age of the individuals, but, roughly, periods from twelve to thirty minutes are most desirable." There is sufficient evidence to show that practice for more than thirty minutes or less than ten is usually wasteful, unless, in the case of the latter, the drill work occurs near the end of a process of overlearning" which has been carried on at spaced intervals.

e. Control of Exercise for Permanent Learning.—It is common experience to have learned material sufficiently for immediate recall which, however, after a period of time, through the law of disuse, fades away. This condition is due to lack of overlearning. Gates[4] concludes that,

> . . . The evidence bearing on this problem is insufficient to justify a confident statement, but it indicates that one should overlearn somewhat at the beginning and leave the remainder of the overlearning to reviews at constantly increasing intervals. The first review which should be relatively long, may be held after an interval of forty-eight hours; the next review, somewhat shorter, a week later; the next shorter

[1] GATES, A. I., "Psychology for Students of Education," p. 255.

[2] It is not to be interpreted that phases of the psychology of drill not discussed here are unimportant. For a complete understanding of the drill process the reader will do well to understand as much of the psychology and technique of drill as he can secure.

[3] GATES, A. I., "Psychology for Students of Education," p. 286. Quoted by permission of The Macmillan Company, publishers.

[4] GATES, A. I., "Psychology for Students of Education," p. 287. Quoted by permission of The Macmillan Company, publishers.

still, three weeks later; the next, two months later, followed by other reviews at intervals of six months or more.[1]

According to Gates, then, the teacher must be sure that the material or process is in the beginning thoroughly learned so that it may be recalled more than once and beyond the immediate time. A definite schedule of subsequent drill periods should then be instituted to insure permanent mastery. This is, unfortunately, not done to any great extent in the classroom at present. Such practice necessitates a careful record of the dates and the length of all drills in order that a time schedule may be established. It is wise for the teacher to keep all this data in a notebook so that a systematic adjustment of drills can be kept to facilitate the development of such a schedule. If this scientific method of exercise were included as part of the regular technique of drill, less fading out of necessary educational equipment on the part of the students would occur. The too common practice is that drill periods are often introduced in a hit-or-miss manner with little or no consideration for the psychology of the process and must thus fail to accomplish their major purpose.

Problems and Exercises

1. In an eighth-grade arithmetic class the teacher found that if she slowed down the drill work on rapid calculation to meet the needs of the slower pupils, the more proficient became restless. If she speeded the work up, it immediately became too difficult for the slow. What suggestions would you give to meet this problem?

2. A teacher of first-year Latin reported that her students seemed to make very careful preparation on the mastery of a Latin vocabulary and did excellent daily work. She stated, however, that after a short time they would forget much of what they learned. What are the probable causes of this situation and what are the remedies?

3. In a freshman shorthand class a teacher discovers that many of her students have reached a plateau and for some time have made no noticeable improvement. Suggest a diagnostic procedure which may be used to arrive at the cause.

4. A teacher of beginning chemistry found that her students needed much more drill than she was giving them on working out chemical equations. She

[1] The writers would substitute "practice period" for "review" in the above quotation. See Chap. XIII for definition of "review" which does not meet Gates' interpretation.

proceeded to give this additional work which was distasteful to the students. Suggest ways in which a readiness for such drill work could be established.

5. A teacher of fifth-grade handwriting set a model of the finished product of handwriting before the pupils for them to imitate. She then instructed them to write very carefully to insure a good imitation of the copy. In their effort to "copy" it well they resorted to a slow drawing movement. What are the mistakes of such technique, and what sort of a copy should this teacher have set?

6. Establish criteria for the selection of material which is to be "drilled."

7. Select a topic which would be essentially drill material, from the subject you are to teach, and indicate how you would proceed to develop readiness for it on the part of your class.

8. Give illustrations to show that "repetition without attention" does not result in productive learning.

9. In what ways does the "direct method" of teaching languages aid in the development of clear focalization?

10. What are the advantages of requiring students to keep individual graphs or other such records of progress in drill activities?

References for Further Study

Colvin, S. S., "Introduction to High School Teaching," Chap. X, The Macmillan Company, 1917.

Davis, Sheldon E., "The Work of the Teacher," Chap. VII, The Macmillan Company, 1920.

Earhart, Lida B., "Types of Teaching," Chap. XIII, Houghton, Mifflin Company, 1915.

Holley, Charles E., "The Teacher's Technique," Chap. VIII, The Century Company, 1925.

Maxwell, C. R., "The Observation of Teaching," Chap. VIII, Houghton, Mifflin Company, 1917.

Monroe, Walter S., "Directing Learning in the High School," Chap. V, D. C. Heath & Company, 1927.

Parker, Samuel C., "Methods of Teaching in High Schools," Chap. VIII, Ginn & Company, 1920.

Stormzand, Martin J., "Progressive Methods of Teaching," Houghton, Mifflin Company, 1924.

Strayer, G. D., "A Brief Course in the Teaching Process," Chap. IV, The Macmillan Company, 1911.

Waples, Douglas, "Procedures in High School Teaching," Chap. XVII, The Macmillan Company, 1925.

Wilson, H. B., G. C. Kyte, and H. G. Lull, "Modern Methods in Teaching," Chap. X, Silver, Burdette and Company, 1924.

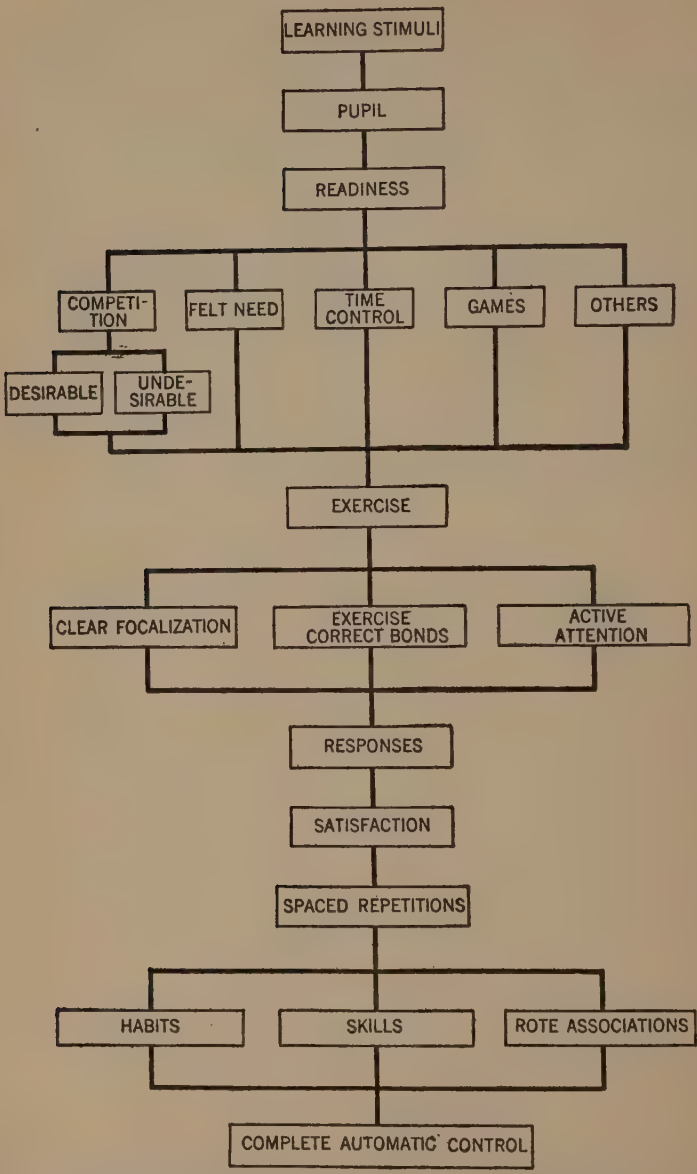

Fig. 17.—Graphical representation of the content of the chapter, The Drill Lesson.

Chapter XIII

THE REVIEW EXERCISE

It was mentioned in the preceding chapter that the term "drill" is generally quite loosely applied in classroom practice and the same condition obtains with the term "review." Too often teachers class any type of reconsideration of subject matter as review in spite of the fact that a review involves a specific technique resulting in a definite type of learning. The inaccurate use of the term in its application to the great diversity of teaching situations is due to a lack of understanding of its technical implications.

One very common confusion that exists is between the terms "review" and "drill." It is true that review involves repetition of subject matter. But the ends of the repetition in the two processes are vastly different; for in the former we aim to establish a "new view" while in the latter a habit, skill, or rote association. If we keep the outcomes clearly in mind, we eliminate any possibility of confusion. It is, of course, not impossible to conceive of a review functioning in the formation of some form of automatic control, but such a product is evolved as a subsidiary end and not as the main objective.

Still another misinterpretation of the term comes in confusing it with the written or oral test. It is not infrequent that teachers are heard to say, "Tomorrow we will have a written review of the week's work," and in checking up on this "written review" we shall find that it is simply a written test designed not to give a "new view" but primarily to test the quality and quantity of the student's learning. If this testing exercise is so designed that it leads to the major objective of a review, the misinterpretation is not harmful for, indeed, as we shall see later, one of the minor aims of the review may be to test. But quite usually the "written review" makes no attempt to test for review outcomes, it being

factual in its nature. The same holds true for the often used "oral review," which may or may not be and seldom is a real review in the technical sense.

I. FUNCTIONS OF THE REVIEW

1. Fusion of Elemental Learning into Larger Units.—The major purpose of the review is to provide for a reflective consideration of material already learned in its somewhat elemental form with the view of utilizing it to develop deeper, broader, and more significant applications and interpretations. Any subject matter, to be an effective instrument of learning, should be a closely knit, unified whole. The course of study is the agency which, at present, furnishes the subject matter used in learning. It is clear that, of necessity, the material of the course must be unfolded to the reacting minds in piece-meal fashion. There is a certain mass of content, viewing the course in its aggregate, and only a certain number of days in which this subject matter can function in the attainment of the established ends. It must thus be cut up into bits, broken up into its elements, each of which must be considered somewhat independently.

Because of this condition the most unified type of subject matter becomes "disjointed." Its elements seem to abound in incoordination and lack of unity and purpose. The teacher is, therefore, faced with the herculean problem of building these elements into educational structures functioning in accordance with our modern interpretation of education. Review is the method by which mere unrelated, insignificant facts, processes, or ideas are welded into units of purposeful learning.

We teach the facts of the various combinations in the fundamental operations in arithmetic, but we review these facts by calling for their application in mathematical problems. We drill on vocabularies and grammatical constructions in languages and we review them by their use in composition work and reading. We teach the physical characteristics of many classes of minerals in mineralogy and review these by having the students identify unknown specimens. We teach the topographical features of a country and direct the students to use this information in the

interpretation of the social and economic conditions of the people of this country.

Without review, learning degenerates into the mere assimilation of facts. Facts are important not in themselves alone but, rather, in what can be accomplished through their application. We know that a fact is of little educative value unless it can be put to work in the accomplishment of some worthy end. It may be interesting to the student to know certain laws and facts in physics, but such information is not significant unless interpreted in terms of their relationships to life. Of what value, for example, is a knowledge of atmospheric pressure if it is not made to serve some useful purpose, as in the explanation of measurement of altitudes, its application in the construction of pumps, and the like? Of what use is it for students to know the type of organization of local government if this is not so interpreted as to make them better citizens of the community? Of what use is it for students to develop a skill in representing words and groups of words in the process of shorthand if this is not put to work in developing the ability to "take" letters or transcribe other forms of sequential material. Thus, it is the major purpose of the review to take the raw facts, ideas, or processes and put them to work for the attainment of a worthy purpose.

2. **Development of Ability to Evaluate Elements of Learning Material.**—One of the great problems in teaching is the development of clear thinking. We learned in Chap. X that an element of this problem is the search for and selection of "promising elements." Only those individuals who know where to look for and how to discriminate in the selection of promising elements become expert in meeting the issues of life. The review serves the purpose of giving much needed practice in this discriminative selection. By its very nature it forces a choice between pertinent and irrelevant elements.

There is a decided psychological advantage accruing from the selection and organization of elements which contribute toward the solution of a review problem. New associations are formed between these elements which serve to fix them for more permanent mastery. When the facts or processes are first encountered

they are, of necessity, undifferentiated as to value. But when needed in some form of application, the new associations formed and the additional exercise effected by their repetition strengthen the bonds between them which tend toward the permanent mastery of those alone which are of significance.

3. **To Lay a Foundation for Further Learning.**—Where subjects are cumulative in nature the mastery of previously studied material is necessary before advance work can be adequately pursued. If, for example, a teacher desires to take up a consideration of division in algebra, sufficient review of addition, subtraction, and multiplication is necessary to be sure that such processes are sufficiently learned, since they are a necessary prerequisite to the process of division. This constitutes really more than a test, it is in fact establishing an apperceptive basis for the process, although the testing elements which could be and sometimes are classed as a separate function of the review, are involved. It is obvious that should any inadequacies be discovered in the ability to operate with such necessary preliminary fundamentals, the teacher would attempt to clear up the difficulties before advancing to the new process. In this way the test element may enter, but only incidentally, for basic and more fundamental than testing is the fact that such a review furnishes a starting point or foundation for the new work. It offers the students something upon which to build; it lends stability, significance, and meaning to the new process.

II. TYPES OF REVIEW—OCCURRENCE AND SUGGESTIONS FOR ADMINISTERING

A careful consideration of the purposes of review gives us a clue as to when it should be conducted. The practice of reviewing only as a preparation for stated examinations has two distinct faults. In the first place it arbitrarily locates the review periods at times which may or may not be suited for the successful attainment of its aims. One cannot artificially select a period for reviewing very far in advance with the assurance that the appointed time falls at a natural break in the subject matter,

unless a sufficient margin is allowed which may lengthen or shorten the period. In general practice today this allowance is not made. In the second place such artificially appointed reviews can provide for the unifying of large blocks of subject matter only, and obviously cannot operate to unify the small.

By virtue of its purposes the review should come at such times as unification and coordination seem necessary. Indeed, it is possible to conceive of three types of reviews determined by the nature and sequence of the subject matter. The selection of the periods for these must be determined by the teacher, for no hard-and-fast rules can be laid down controlling this. Obviously, such selection to be adequate requires discriminating judgment which comes only through a thorough mastery of review techniques and successful experience in administering the review exercise.

1. **Short Daily Review.**—Some teachers conduct short reviews before beginning each advance lesson. Although there are advantages to this frequent use of the daily review, strict adherence to such regularity is of questionable value. In general such a review, because of its nature, should come at the beginning of the class period. Usually from three to five minutes are allotted for such an exercise which may be written or oral in form. One or two well-directed, typical review questions may be asked which calls for an organization and a summary of the important points of the previous lesson.

There are three advantages in the use of this type of review. In the first place, it provides for the establishment of an apperceptive mass functioning in the learning of new material. This has already been discussed above. In the second place, it provides the students with an additional incentive for study, for the expectancy of such a review tends to make more purposeful the material to be learned. It is true, of course, that such a motive for study is not of the most desirable sort, but its use is legitimate when other and more appropriate agencies fail. In the third place, it tends to focalize the students' study toward definite objectives and thus, in addition to being an element of review procedures, is also an element of assignment technique.

The short daily review is difficult to administer, especially when the students have not been trained to meet its demands. They will at first be found to flounder with uncertainty, for skill is needed to organize responses in the short time allowed. This points to one of the dangers in its use, the possibility of excessive time consumption. With the absence of careful controls to prevent this dissipation of time, an entire period can be and often is given up to such an exercise. In view of its ends this is wasteful. Strict limitation must be placed upon its application to protect necessary progress.

A device which is sometimes effectively used to facilitate the development of the students' skill of performance is to assign the review question or questions the day before, as part of the regular assignment with any necessary directions helpful in the preparation. These questions or problems, of course, should be very simple at first and their complexity not increased until the growing power of the students warrants such progress. Much attention to the development of the characteristics of adequate response aids in increasing the students' power.

Teachers making most effective use of this type of review usually do not make it part of their regular daily practice. They resort to it only as the occasion demands. An analysis of its purposes reveals that this must be true, for indeed there are many lessons which have no cumulative properties and again there are many others, the study of which may be directed more adequately by some other means.

2. **Small Unit Review.**—This type varies in extent from the short daily review in that it is given upon the completion of any unit of subject matter regardless of when this may occur. Such a unit of instruction may take only a part of a period or again it may be so extensive as to require several periods. It further differs from the short daily review in the amount of time necessary for its administration. Because of its great importance to learning, which has already been discussed, sufficient time should be taken to weld together the important elements of such a unit. It may be advisable, at times, to devote an entire period or more

to insure complete unification. An illustration will serve to clarify the meaning and use of this type of review procedure.

In one of the most recent books on elementary United States history the writer finds the topic "The Constitutional Convention" covered in about eight pages. Upon conferring with able teachers of elementary United States history he finds that in their judgment it should require two or three days adequately to cover this material in class, including, of course, the consideration of all reference material assigned in conjunction with that of the text. Such a topic, therefore, is a typical small unit at the completion of which a review period is imperative for an understanding of the significance of this important event.

The author of the textbook mentioned above treats the material in chronological order on the basis of cause and effect. He leads up to the Constitutional Convention by showing how the Articles of Confederation, which did not provide Congress with the right to regulate commerce between foreign countries or between states, led to a series of conferences or conventions to consider the problem. He indicates that the first step taken was the calling of the Mount Vernon Convention. But the scope of the results of this convention was so restricted that the real problems were not solved and thus in 1786 the Annapolis Convention met, to which convention only five states sent delegates. Thus since little could be done because of the small representation, Alexander Hamilton suggested that a convention of all the states be called to amend the Articles of Confederation. As a result of this suggestion the Constitutional Convention was called in 1787 with representatives from all states except Rhode Island. The author points out that although the purpose of the convention was to amend the Articles of Confederation, so many difficulties arose that an entirely new constitution became necessary, which, after four months of hard work was ready for state ratification.

It is clearly evident that in slowly unfolding this material to a class a broad view of the significance of the "leading up" situations cannot be grasped without a new view of the entire unit. Each subsequent convention was important but its import is not clear until the whole unit can be viewed in its entirety.

To derive the most benefit from a review of this sort, thorough preparation for it should be made by the students. The skillful teacher will direct this preparation by careful assignment of the material forming the basis of the review. This involves more than the mere direction to "Review the material on pages —," for if so assigned the students' study will involve only a recall of the facts previously considered. On the other hand, the teacher should focalize the students' attention on preparing for the type of response which he desires them to make. This may be facilitated by giving them problems or questions of a typical review nature, which call for the application of the facts toward a unification. The ability of the class to handle these more-or-less abstract forms of problems or questions offers the teacher the cue as to how much assistance he must give the students to successfully cope with them.

The review in class may be either written or oral. The assigned questions or problems and others of a purely thought type should constitute the plan of attack. Great emphasis must be placed upon the type of response if skill in organization and interpretation of facts is to be developed. It is a simple matter for students to memorize facts, but it takes great patience and much careful direction to train them to interpret their significance. Thus such a question as, "What were the Articles of Confederation?" can be answered with little effort on the part of the teacher to develop the skill in coping with such a question. But the question, "What was the significance of the Articles of Confederation to the formation of the Constitution?" requires a skill which only careful training can effect.

We must not ignore the use of the written review, for it is a splendid means of developing written expression. An occasional review of this sort is of great value and should receive some emphasis by the teacher.

3. **Large Unit Review.**—This has been classed as a "review of reviews" as it involves the coordination of many separate units. In this exercise, which will be much more extensive than either of the other types discussed, the emphasis will be placed on major issues. A few large, well-directed, and carefully selected

problems furnish the basis for such review procedures. A review of this sort is concerned not with the interpretation of elemental facts but, rather, with the welding together of the various interpretations which have been previously developed in the reviews of small units. True, many of the facts must necessarily be recalled but the big objective is to establish the significance of big movements.

Such a review would come at the completion of any large movement. A time well suited for intensive work along this line is near the close of the course for at this time various movements in relation to each other can be considered. In the past the type of state examinations set by the examining boards almost prohibited the use of such review procedure, but, fortunately, the tendency is now toward tests of a more comprehensive sort. The teacher who uses such technique will be at less and less disadvantage as time goes on and as the emphasis in our schools swings away from the demand for factual reproduction.

Another illustration drawn from the field of history will point out the essentials of the large unit review. In a high-school textbook on American history the subject of the "North American Indian" in its various phases is scattered from pages four to four hundred eighteen. It treats of the subject from colonial times down through 1914. In the discussion, the author considers the following topics: early civilization, relations with English colonists, relations with the French, relations with the Dutch, Indians in the West, Indians in the South, government treatment of Indians, and Indians in literature.

Most of these units of this big problem are by their nature quite complete in themselves. Each small unit is in itself comprehensive enough to require from one-half to two or three periods each for a complete discussion. Thus there would be as many attempts to unify the facts as there are subdivisions of the big problem, which would be accomplished by means of the small unit review. But before a student can get the complete significance of the American Indian in his relation to the development of the country, a panoramic view of all of his relations must be given. This can be facilitated greatly by means of a "review of the reviews."

Here, as in the case of the small unit review, the most effective work can be accomplished by carefully directing the students' study. The same general type of technique obtains as in the case of the small unit review and thus does not need a special consideration.

Problems and Exercises

1. A class in high-school economics has done good daily work showing much preparation of one sort or another. When, however, they were tested at the end of the quarter on the interpretation of these facts the results were unsatisfactory. What is the cause of this condition and what steps should a teacher take to meet such a difficulty?
2. A teacher of eighth-grade history desired to make use of the short daily review but found that the students, not being familiar with questions of this sort, floundered hopelessly. They failed in the ability to organize their responses and in general resorted to a mere factual treatment. What steps should this teacher take to develop in her students the ability to cope with such questions?
3. What is the relationship between the review and problem solving?
4. In what way or ways is review functionally related to the objectives of education?
5. Why is it true that the review exercise should be as carefully planned if not more so than a regular recitation?
6. A teacher of first-year, high-school civics reports that she cannot "cover the ground" and adequately prepare her students for the final examinations if she uses the method of the large unit review. What suggestions would you give this teacher?
7. Distinguish clearly between *drill* and *review*. In what ways are the two terms confused?
8. Prepare a series of questions to be used in:
   a. Short daily review.
   b. Small unit review.
   c. Large unit review.
9. Discuss the importance of the review exercise to learning.
10. Can we get a "new view" of elemental learning in:
    a. Mathematics?
    b. French grammar?
    c. Shorthand?
    d. Biography?

Illustrate.

References for Further Study

Douglass, Harl R., "Modern Methods in High School Teaching," Chap. II, Houghton, Mifflin Company, 1926.

EARHART, LIDA B., "Types of Teaching," Chap. XIII, Houghton, Mifflin Company, 1914.

HOLLEY, CHARLES ELMER, "The Teachers' Technique," Chap. X, The Century Company, 1922.

MINOR, RUBY, "Principles of Teaching Practically Applied," Chap. XII, Houghton, Mifflin Company, 1924.

STORMZAND, M. J., "Progressive Methods of Teaching," Chap. VIII, Houghton, Mifflin Company, 1924.

STRAYER, GEORGE D., "Brief Course in the Teaching Process," Chap. IX, The Macmillan Company, 1911.

WAPLES, DOUGLAS, "Procedures in High School Teaching," Chap XIX, The Macmillan Company, 1924.

WILSON, HARRY B., GEORGE C. KYTE and H. G. LULL, "Modern Methods in Teaching," Chap. XVIII, Silver, Burdette and Company, 1924.

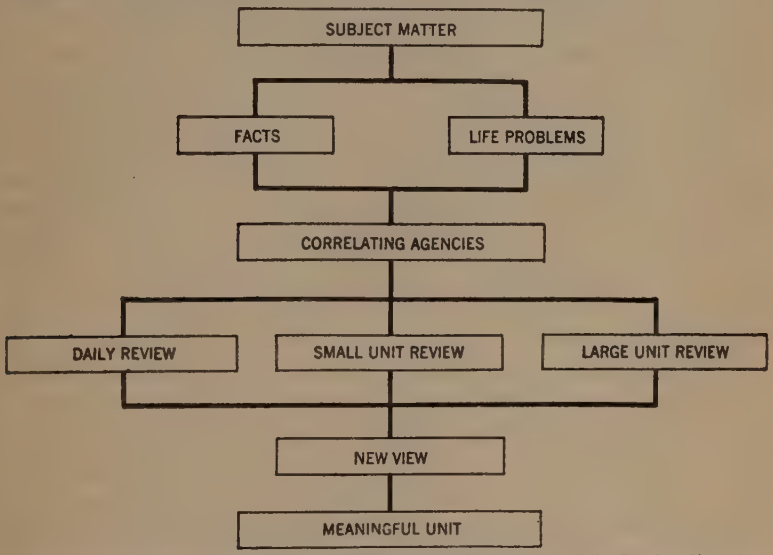

Fig. 18.—Graphical representation of the content of the chapter, The Review Exercise.

Chapter XIV

ESSENTIAL PRINCIPLES OF EFFECTIVE STUDY

I. THE PROBLEM OF DIRECTING STUDY

1. The Need of Understanding Elements of Correct Study.— To accept the suggestion made by F. M. McMurray that the center of gravity of the school must be shifted to the learner, places the teacher in an indefensible position if he does not provide his students with proper facilities to meet this added burden. Part of the program of every successful teacher should be given over to the development of the correct habits of study. This type of learning must be directed with as much, and perhaps more, emphasis than is placed upon the attainment of other habits and skills. It is as important for a student to be able to study effectively as it is for him to develop an ability to read, or to write, or to perform other similar functions, since much of his learning must necessarily come through his independent reactions to the subject matter.

The problem of directing efficient study is thus one of tremendous moment to learning. Classroom experience backed by much objective data[1] leads to the conclusion that no little emphasis needs to be placed on the problem of training students to do independent study. It is quite generally true that teachers take it for granted that students are proficient in the art. They seem to feel that in each child there is some innate capacity which needs no direction, but which leads naturally to the attainment of correct study habits. Such an assumption works great hardship on children, for the development of correct study can seldom be accomplished unaided. The process is one of

[1] See investigations of E. R. Breslich in "Thirteenth Year Book" of the National Society for Study of Education, and October, 1912, issue of *School Review;* also those of W. C. Reavis, in *School Review*, June, 1911, and *Elementary School Teacher*, June, 1911.

many intricacies and the mastery of its technique requires long and careful development.

To give such training requires a knowledge of the fundamentals. That a teacher himself may have mastered the ability to study but lack the knowledge of some of the essentials of the process is an established fact. When one develops a skill of any sort, conscious direction of the various reactions is a necessity. But gradually as the skill develops, and the activities become more and more automatic, there is a corresponding decrease of conscious control. After the skill is fully matured one soon forgets the knowledge of how it was consciously developed.

If this were not the case the slightest analysis of the movements involved, on the part of an individual who is an expert penman, would suffice for the teaching of the process to beginners. But we know that thorough training is necessary before a teacher can teach handwriting. The activities of the process have become so firmly fixed, mere introspection cannot possibly reveal all of the rudimentary movements. The teacher must envision all of the intermediate steps to be taken by a child in the production of an effective automatic movement.

To a limited degree, the same holds true in the case of study. To test this out, the writer asked twenty experienced teachers and one hundred and eighteen college seniors who were preparing for teaching, both groups of whom had no special training in teaching how to study, to write out a set of suggestions on "How to study." Although these people had, to a greater or less degree, mastered the art of study they proved to be greatly deficient in the understanding of some of the elements most fundamental to the process.

It is essential that teachers become thoroughly versed in those essential elements which students must know in developing a mastery of correct study habits. The great importance of study to learning makes the direction of study technique one of the most important aspects of a teacher's work.

2. **The Tendency toward Supervised Study.**[1]—Authorities in education and school officials are coming to agree that the tradi-

[1] For detailed account of supervised study see HALL-QUEST, "Supervised Study."

tional home study must go. Another practice upon which the stamp of disapproval is being placed is the use of the general study halls where are grouped large numbers of students studying a great variety of subjects without adequate supervision. Both home study and general study halls fail because of the lack of facilities to direct study activities. In the place of these two types of study situations we find a slow but marked tendency toward "supervised study."

It is not our purpose in this type of book to consider the problems of such a study organization, for it is not, as yet, general enough in its application to warrant a careful analysis here. Its introduction in a school system constitutes an administrative problem beyond the control of the classroom teacher. The beginning teacher, however, should know something of the operation of such a system. It proceeds on the plan that the studying be done in school under the direct supervision of the teachers of the respective subjects. The school program is so organized that the study period either precedes or follows the recitation in the subject; usually the latter obtains. The plan of supervised study is still in its infancy so there are many kinds of organization going under that name—good, bad, and indifferent. But all aim at one objective and that is as the name suggests, closer supervision of the study activities of children, with the view of better direction of the process.

The material in this chapter is general enough to suggest a technique applicable to either supervised study or home study. The emphasis is placed, however, on the latter as it is in more common use at present. The underlying principles of study are the same regardless of the environment in which it is executed. All that is needed is an adaptation of these principles to the existing conditions.

II. FACTORS CONDITIONING STUDY

1. Developing a State of Readiness.—The first step toward directing study is to get the students psychologically ready for mental activity. This is accomplished mainly through the assignment. Children may know exactly how to attack a

lesson but if they have no desire to study it, all of this ability is likely to be wasted. It is of particular importance to exert great care in this direction, especially where a system of home study is in vogue, for in that case the appeal must be made strong enough to meet conflicting influences which prevail under unsupervised conditions. The importance of developing readiness has already been discussed in Chap. III and will thus need no further emphasis here save to say that it is of prime importance to study. It is a factor that should be an ever present challenge to every teacher.

2. **Elimination of Those Stimuli Which are Useless but Which May Become Prepotent.**—Many of the problems of study center in the students' inability to concentrate. The power to concentrate involves the selection of those stimuli only that are directly contributory to the attainment of the set objective. During study or in fact at any time an individual is surrounded by almost numberless stimuli each crowding in, demanding recognition. Thorndike's law of "piece-meal activity" teaches us "that one or another element of the situation may become prepotent in determining the response."[1] Obviously, the prepotence of the stimulus depends in part on its intensity and on the mind set of the individual. At this moment the writer was disturbed by an automobile horn operating violently under his study window. His attention was immediately directed from his work at hand to the stimulus outside. Is this horn blown with a malicious intent to disturb or is it the act of some thoughtless individual? Is it operated with the endeavor to attract the attention of someone in one of the homes or as a protective measure for a pedestrian? Perhaps a child is in the road and dangerously close to an accident.

These and other thoughts flashed through the writer's mind one after another in rapid succession distracting his attention from his major purposes. For the moment, his mind set was disturbed to the extent that it ceased to function in the selection of those bonds immediately pertinent to the successful prosecution of the

[1] THORNDIKE, E. L., "Educational Psychology," Vol. 2, p. 13. Quoted by permission of the Bureau of Publications, Teachers College, Columbia University.

problem at hand. The disturbing noise became a prepotent stimulus and this mainly because of its intensity. Now there are many other elements of his writing environment all of which are pushed back out of his consciousness. On the desk, for example, there are books, writing materials, typewriter, telephone, etc. In the room are articles of furniture, bookcases, filing cabinets, pictures and the like. About the house and out of doors are those usual sounds more or less attendant upon any household. The intensity of these, however, is not sufficient to disturb the mind set and thus do not bid for active attention. In directing study, the problem of ridding the study environment of those elements which might become prepotent but which lead to wasteful reactions is of fundamental import.

a. Adjustment of Environment to Avoid Distracting Noises.— The investigations of W. C. Reavis, as well as the common experience of those in touch with the problem of study, point to the fact that little is done in the homes to protect children from distracting noises during their study. It is important that students should be provided with a special place for study which is free from noise and disturbing factors. Where this is not the case, the children are in contact with a great number of unnecessary but nevertheless prepotent stimuli which, because of their nature, command attention. At best it is difficult to develop a mind set of sufficient vigor to hold children to their tasks without introducing unnecessary "static."

Conversations are intense stimuli for, even if not unusually loud, they make a strong appeal because of their personal nature. Children have a great desire to "know what is going on" and they usually divide their attention between this conversation and their work, resulting, of course, in the breaking down of concentration. The victrola and the radio are, at present, making an insistent demand for the attention of students whose study environment is not so far removed as to be out of direct hearing. The casual caller in the home offers another difficulty of the same sort.

Children should be given a place for study which is so remote from the family that the intensity of these usual household noises is reduced to a minimum. The child's room if properly located

offers a splendid place for study. But often there are conditions which make it impossible to use such a room for study purposes. In the rural communities particularly, sleeping apartments are unheated, a feature which prohibits their use. The writer recommended, with much success, that in such cases the kitchen be selected. In communities of this sort, such a room is well heated and is sufficiently remote from family activity to warrant its use after a few necessary adjustments are made. By closing the door, thus shutting it off from the rest of the house, along with the proper adjustment of light and with the provision of other study requirements which will be mentioned later, this room can be made to serve as an ideal study environment.

b. Establishment of Proper Safeguards to Insure Physical Comfort.—Physical discomfort of any sort tends toward a flagging of attention. It is true, of course, that with a firmly established mind set toward the accomplishment of certain reactions, the distracting power of discomfort can be completely broken. But we must be ever mindful of the fact that as teachers in directing study our problem centers in children who are immature, with motives the force of which is highly variable. It is always a safe principle to eliminate the possibility of such distractions of a physiological nature from becoming prepotent. The same conditions of light, heat, and ventilation which were discussed in Chap. V need no elaboration here. They should be maintained in the study environment. It is inadvisable to study immediately after a heavy meal for the blood is taken from the brain at this time and sent to the stomach. This makes mental activity very difficult. Tight clothing should be loosened for it slows up the blood stream and thus tends to destroy concentration. In general, all of those factors which have an adverse physiological effect on students and which might thus command their attention should be carefully adjusted.

Another phase of the problem of removing elements causing physiological distractions, but which cannot be accomplished by suggestion alone on the part of the teacher, is the removal of physical defects. Augusta F. Bronner[1] records the cases of sev-

[1] BRONNER, A. F., "The Psychology of Special Abilities and Disabilities," Chap. III.

eral children who were classed as mentally dull but whose poor intellectual showing was due to physical conditions which, when remedied, resulted in much improved mental ability. The weight of all such investigations indicates that physical defects tend to interfere with intellectual ability. It should thus be part of the classroom program to look for symptoms of physical disability and the discovery of such cases should be reported to the school nurse or principal.

c. All Study Materials Should Be Readily Accessible.—"Getting away to a good start" is of great moment to successful study. Once the mind set is developed toward study, the introduction of any irregularities which prevent immediate activity act as an annoyer, for we know that when a bond is ready to act, not to act is an annoyance. Also, careful protection against the unfavorable application of the law of effect must be made.

The first safeguard to establish is to make provision for a study table or desk, permanently located and well suited for study pursuits. It should be supplied with all materials needed, such as pencils, paper, rulers, books, and the like. The advantage of having all study materials located in one place is obvious, for, other things being equal, it assures immediate work. When a student has to hunt about the house for his work material his fervor for study is likely to be materially decreased.

d. Ridding the Study Environment of All Objects Which Offer Strong Emotional Appeals.—The quite common practice of students' making their place of study a trophy den is harmful to concentration. The writer in an investigation of the study environments of high-school students found that both boys and girls, but particularly the former, made the study room the favorite place for the hoarding of choice relics of recreational and social "conquests." Among the articles often so located were boxing gloves, baseball bats, fencing foils, golf sticks, dance programs, lip sticks (stolen from girls), pictures of athletes of both national and local reputation, cheap trashy novels, popular magazines, and the like. In most cases these "treasures" were exhibited on the walls in the students' immediate vision during all study work.

Such collections, in general, are not undesirable, but, if located in direct view during study, they constitute a real distraction. Associations of a pleasurable sort are connected with them and we know that individuals like to dwell on those memories to which pleasure and satisfaction can be attached. Thus, during study, should there be the slightest flagging of attention due to any one of a number of causes, the perception of these trophies will shunt the mental activities into unproductive channels. These stimuli constitute a constant threat to become prepotent at any time. The range of vision should therefore be cleared of all such stimuli as do not lend themselves to the development of the correct mind set toward study.

3. **Use of a Study Schedule.**—In our complicated and extremely busy life of today systematic budgeting of time is a fundamental necessity. Generally speaking, those individuals who plan definitely for the activities of the day, with reasonable elasticity, to be sure, accomplish the most. With the surging in of the multitude of opportunities to spend time in one way or another, it is difficult to make a judicious selection. A time budget acts as a selective agent for time expenditure, providing adequately for the performing of those activities which make up a well-rounded day. It is just as important that one plan for leisure as for work, and neither of the two should encroach upon the other. The way to eliminate the possibility of probable overlapping is to plan adequately for proper time distributions.

Conservation of time through budgeting can be learned and this learning may be accomplished, in part at least, through skillful direction in the school. The study schedule which operates on the basis of a time budget if used by students gives training in systematic time usage. The adjustment of such a schedule should, of course, be to the needs of the individual. Some teachers have, for example, recommended with no little success that students study those subjects in school which give them the most trouble. By such practice they can secure any needed assistance either during school or before they leave for home. This tends to insure more complete preparation, for it is not

uncommon to find students who will give up a task readily upon encountering difficulty.

The time best suited for home study is highly problematical and must be determined in part on the basis of temperament and in part by social and economic demands. It seems advisable, however, to recommend that unless conditions make it imperative, studying should not be done immediately after school, for this time is best adapted to recreational activities which should be a part of every child's daily program. In the final analysis, however, home study should be started at the time when most effective work can be done. Students should be advised to experiment in the effort to locate this time.

In general, it seems that perhaps the most effective time for home study is after dinner at night. To some, however, early morning study is most desirable. A great many students reported in an investigation carried on by the writer that they could do their best work at this time when their minds were clear and they were thoroughly rested. The grave danger of this practice, an admission made by the reporting students themselves, was that at times sleep offered a greater appeal than study.

Once the students can settle on the time to begin, they should be urged to start work at once and make this starting an invariable procedure in the effort to establish a habit of study at this time. Sufficient time in the aggregate should be allowed for the successful completion of the regularly assigned daily work. This allotted time should then be broken up into periods arranged on a schedule basis and the sequence habitualized.

The order of studying lessons again is a matter to be determined by the individual. Some students prefer to begin study by attacking the most difficult subject and concluding with the least exacting. These individuals are so constituted that the stimulus of the thought of easier work ahead acts as a spur to keep them to the task. Others can do best by starting with the easiest subject and working up to the most difficult. The choice of the procedure should be determined by experimentation and not until the most effective method has been established should the order be definitely placed in the schedule.

The study schedule should be elastic enough to provide for unforseen emergencies. Some lessons may be unusually long and hence more time must be allowed to meet such contingencies. Slavish adherence to a program is undesirable. It is a means to an end and not an end in itself.

4. Students Should Assume Study Attitude.—It was mentioned above that a correct mind set is of tremendous import to study. In addition to the establishment of readiness during the assignment, there are other agencies for the development of a correct mind set. The immediate assumption of an attitude of work is a factor in the establishment of this mind set. Students should be urged to avoid lounging positions. It is advisable that they sit erect and in straight-backed chairs. Before beginning to work, all materials should be carefully arranged to avoid unnecessary interruptions which are often fatal. If students be impressed with the fact that they are working for their own improvement and not for the benefit of the teacher, greater industry is stimulated. To urge them to attack their work vigorously with the grim determination to learn tends to inhibit listlessness. The development of the habit of intense application is a necessity, for if students can be directed to assume attitudes of work they will assist in building a mind set that functions in the production of a high degree of concentration.

III. A SUGGESTED STUDY SCHEME

There are no doubt a great many varieties of study schemes each of which may be as effective as the one suggested below. As in the case of all of the other teaching techniques, there is no one way of attacking a lesson and we are not attempting to disclose "the one and only method" of accomplishing it. Our efforts have been only to indicate how some of the commonly accepted principles of study can be reduced to a formula of use in producing successful endeavor. Our program is not to be accepted as dogma and it is doubtful if it should be incorporated as it stands in its entirety. It is designed to serve the teacher as a basis for the development of his own plan, selecting those elements of it

that fit and rejecting others that do not meet the exigencies of his own local study problem.

Nor has it been our objective to attempt to include in a single chapter an exhaustive analysis of the problem. The scope is too extensive to accomplish such a purpose. Only those principles have been discussed with which the writers have had the greatest success in the direction of students' study. This does not mean that other principles not given are unimportant or impractical. The suggested plan is one of many which may be developed, but it is one that has been evolved over a period of years through working with high-school students, and one that is known to function if judiciously used.

1. **Use of Rapid Preliminary Review.**—Three advantages accrue from a short preliminary review before the study of the assigned work. In the first place, it acts as a "warming up" period. When one sits down to do mental work it takes some little time to "get into motion" for it is difficult to get the mind down to the task. It is likely that just previous to the study period the attention was directed toward pursuits other than those which are intellectual. The short review will help to center the attention on mental activity and it will put the child in a studious frame of mind.

In the second place, the preliminary review provides for a recall of facts, principles, and processes which act as a starting place for vigorous mental activity. Thus the mind is not plunged into the problem of assimilating new material without first establishing a definite basis for it. The advance work is made more significant and purposeful by its integration with material already learned. Further, such a review provides for a spaced repetition of material already learned. We found in our consideration of drill that it is important to have frequent repetitions at varying intervals for it helps to fix more definitely that which has already been learned.

2. **A Cursory Reading of Entire Assignment.**—It is well to read the entire assignment through once from beginning to end as rapidly as one would read a magazine or newspaper. It is not

necessary and in fact it is unwise to attempt to master the details at this first reading, for all that is to be accomplished at this time is to receive a brief survey of the scope of the material to be studied. This gives a bird's-eye view of the lesson in its entirety and thus makes the meaning of its elements more clear. It preserves the unity and establishes continuity.

3. **Subsequent Readings Should Be Intensive.**—After the extensive reading of the assignment the student is now ready for real intensive work. The attack will now shift to the paragraph which should be the basis of alert mental activity. A good practice is to teach students to epitomize the meaning of each paragraph in a single sentence or so. This is excellent for it develops in them the ability to summarize learning units in their own words. Obviously, before a terse statement of this sort can be made the content of the paragraph studied must be thoroughly understood. Jotting this statement down on a piece of paper serves the purpose of furnishing the main headings, at least, of an outline the use of which we shall speak of later.

In every well-formed paragraph one can find a topic sentence which is the key to the thought expressed therein. If the above method of epitomizing is not used, that of writing out the topic sentences for subsequent use is helpful. In a manner similar to that suggested, the topic sentences may become the skeleton of an outline of the entire lesson. This is not so good a method as the first for it may lead to bookish responses from the students. Our effort should be continually to stimulate original reactions and, unless carefully guarded, copying the author's statements, even in part, may defeat our purposes. The method does, however, have merit if used with the danger in mind.

Still a third method of intensive study of the paragraph is to underscore important statements. Care should be taken to limit the underscoring to those statements only which are of outstanding significance. There is little or no value to the practice sometimes in current use where almost every statement, important or otherwise, is given emphasis by marking in some way. It goes without saying that many statements serve only for subsidiary purposes and are not significant in themselves.

The student must be trained to identify these and separate them from those of real importance. To emphasize them by underlining confuses rather than aids and inhibits the process of evaluation which must of necessity play a prominent part in study technique. In this same connection, writing notes in the margins, numbering sequential material not so designated by the author, listing cross-references where amplification of the content covered in the text can be found in supplementary books, and the like, aid the study process.

Some object to the marking of textbooks on the basis that it is defacement but this is an unfounded objection and has little or no weight. The text must be considered a tool of learning and as such must be put in condition to serve in the most effective manner possible. Any adjustment of the tool that can be made to facilitate its better performance is legitimate. If such marking makes textbooks more useful to learning, which is unquestionably true, the "defacement" is not only legitimate but highly advisable. But we must remember that the students must be trained to mark books correctly, for it is very difficult for them to attain the skill without careful direction.

4. **Following Such Intensive Reading Should Come the Attempt to Reproduce What Has Been Studied.**—If an outline or the list of epitomized statements has been kept, the students should make use of this to assist them to build up the material of the assignment. It is well for them to take one topic at a time and with book closed, using this as a nucleus, build around it all of the pertinent material of which it is representative. Failure in the ability to do this should be the cue for more intensive study of the paragraph. Pursuing this plan down through the entire outline will tend definitely to clinch the material.

It is strange, indeed, but necessary to have to suggest that teachers should direct students to emphasize the study of those points for which the weakest bonds have been established. It seems to be quite characteristic of students to exercise those reactions most firmly learned but to fail to repeat those that need greater strength. The probable reason for this is that we get satisfaction from performance of those activities which we

can do well and with success. Little real exacting application is needed for the repetition of well-established bonds, while in the case of uncertain mastery or complete lack of it great and painstaking effort is demanded. Thus, in reproducing from the outline little or no attention need be placed on that which is learned but the major emphasis should be directed to that not firmly established.

It seems to be quite common practice for students to limit the applications and uses of the material learned to those made by the author studied. This, of course, leads to superficial mastery, for until the content actually becomes part of the individual's equipment the uses of it must be artificial. During the intensive study, one real test of mastery is the use to meet needs established in the minds of the students. The learner should develop his own applications and find original ways of illustrating, for in this way only can the learning become purposeful and significant. If this is done the temptation of verbatim mastery will not easily arise.

5. **Spaced Rest Periods Desirable When Needed.**—It is well not to carry study beyond the point of ennui and it is doubtful if it should reach this point. Effective work progressively diminishes as ennui becomes established. The symptoms of this inhibiting force are flagging attention, loss of interest in the task, breaking down of the state of readiness, and a general feeling of physical fatigue. If this condition sets in before the student has finished studying, a change of occupation is advisable. Some type of activity largely physical in its nature but not too vigorous will facilitate the return of mental ability.

If provision in the student's study plan is made for a ten- or fifteen-minute period for the recall of main items of the lessons several hours after the intensive work is done, such a recall helps more permanently to fix the learning. If, for example, a student does his main work at night, a short period in the morning is of value in strengthening the bonds already formed. The importance of this short recall period cannot be overemphasized for in actual practice it is quite generally neglected.

IV. OPERATING A CAMPAIGN FOR EFFECTIVE STUDY

There is a growing recognition of the importance of study to learning and to effective school work. More and more school systems are realizing that the concerted effort of their faculties is needed to swing into action a school-wide program for the development of better study techniques. Many schools, for example, give intensive training to certain groups of the student body and this is coordinated by the emphasis of the classroom teachers on the suggested techniques.

In several schools known to the writer, a book on study was introduced as one of those required in high-school first-year English. The freshman class was chosen in order that these students might be launched on their high-school career with an effective study attack. The English course was selected as the field of work, for this course was required of all first-year students and the entire entering class was in this way reached. Of course proper study methods should have been taught long before students reach high school, but in the cases of these schools mentioned such was not the condition and the plan was an emergency measure.

In the use of such a scheme it will be necessary for schools to exert great care in the selection of the book to be studied. Still another caution should be exercised in the selection of the teacher to direct the study of such a book. He should first of all be "sold" on the idea in general and must further be well versed in the essentials of study. To insure the cooperation of the other teachers, a necessary feature of such a program, an effort should be made to have them see the need of the campaign and also the necessity of preparing themselves to aid in the direction of study methods as applied to their own particular courses of study.

But perhaps more often than not, the teacher will not step into a teaching situation where concerted effort is directed toward effective study. In such a situation he, acting alone, can do much effective work along this line. True, coordinated action is most advisable but we must not despair if such cooperation is lacking. It is well, right at the beginning of the year, under such conditions, to outline a plan of attack that involves most of the features of effective study. It is also advisable, from time to

time, to turn the regular recitation period into one of supervised study where the students can actually put into practice, under direct supervision, those phases of the plan recommended by the teacher. Great stress should be placed upon meeting the needs of the individual student, for some will have difficulty applying certain elements of the technique while other will experience obstacles of another sort.

Experience in working with students along the line of improving study methods demonstrates that progress is made very slowly. At first it seems that no inroads are being made and that the effort is entirely wasted. This is largely because the idea of effective study has not taken root in the minds of the students. Once the need is aroused and the study process becomes purposeful, as in every other type of learning, readiness for the development of the skill is established.

The teacher must persist in his efforts to train students to study effectively. He must not assume that because his suggestions are not at first followed, he has failed. Such a condition should, on the other hand, act as a challenge calling for renewed and more skillful effort. It takes much time and infinite patience to overcome old habits and to substitute in their place new ones calling for more intense and exacting activity. Slipshod study is easy, but effective study calls for serious application and one cannot get this effort without slowly building for it. The cost to the teacher is great but the stakes are greater.

Problems and Exercises

1. A teacher of first-year Algebra, new to a particular school system, finds, after investigation, that the students had no well-ordered study system. What steps would you take to assist this class in its study problems?
2. The students of a seventh-grade geography class prepared their daily work with the emphasis placed on memorizing the words of the author. The teacher of this class gave the students no outside reading. Wherein is this a problem of directing study and what remedial measures could be applied?
3. Analyze your own study habits in terms of modern accepted practice.
4. Suggest ways of modifying the "suggested study scheme" given in this chapter to fit the study of the materials of the course of study you are to teach.
5. Discuss the relative importance of the study exercise and the recitation.

6. In a certain high school mimeographed sheets of study rules were given out, one to each student. It was found, after a careful check up, that only a small percentage of the students made use of this information. The principal concluded that his plan was useless and discarded it. What were the causes of the apparent failure and what plan would you suggest which would make effective the use of such a list of rules?

7. A teacher of biology in conference with one of her first-year students who was failing found that he worked in a drug store from seven until ten-thirty o'clock each evening and thus had little or no time for study. She suggested that he study from four to six but the student rightfully insisted that he have some time for himself. Map out an acceptable study program for this student assuming that there were eight periods of forty minutes each in the school day and that he was carrying elementary algebra, biology, beginning Latin, and first-year English, all of which required preparation.

8. A teacher in discussing a study program with her students found that the parents of one boy would not provide a suitable study place. What steps should this teacher take to right this condition?

9. In what ways can a teacher during the assignment prepare for more adequate study?

10. What are the factors existing in the modern home that militate against effective home study? Assuming home study is in vogue in your school, how would you proceed to meet these inhibiting forces?

References for Further Study

Book, William F., "Learning How to Study and Work Effectively," Ginn & Company, 1926.

Butterweck, J. S., "The Problem of Teaching High School Pupils How to Study," Teachers College Bureau of Publications, Columbia University, 1926.

Crawford, C. C., "The Technique of Study," Houghton Mifflin Company, 1928.

Edwards, A. S., "The Fundamental Principles of Learning and Study," Warwick and York, Inc., 1920.

McMurray, F. M., "How to Study and Teaching How to Study," Houghton Mifflin Company, 1909.

Parker, S. C., "Methods of Teaching in High Schools," Chap. XVI, Ginn & Company, 1920.

Stormzand, M. J., "Progressive Methods of Teaching," Chap. III, Houghton Mifflin Company, 1924.

Thayer, V. T., "The Passing of the Recitation," Chap. XII, D. C. Heath & Company, 1928.

Thomas, F. W., "Training for Effective Study," Houghton Mifflin Company, 1922.

Whipple, G. M., "How to Study Effectively," Public School Publishing Company, 1916.

WILSON, KYTE, and LULL, "Modern Methods in Teaching," Chap. XIV, Silver, Burdette and Company, 1924.

YOOKAM, GERALD A., "Reading and Study," TheMacmillan Company, 1928.

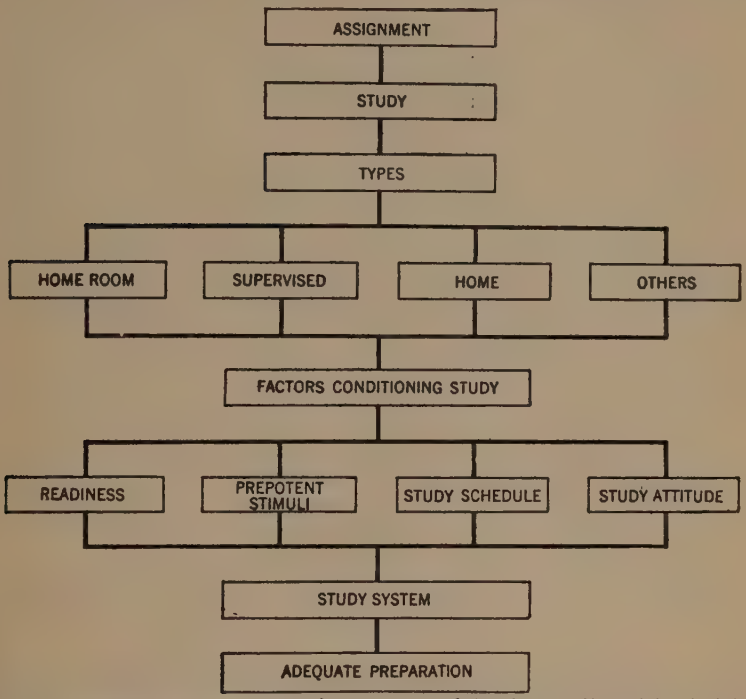

Fig. 19.—Graphical representation of the content of the chapter, Essential Principles of Effective Study.

Chapter XV

THE TEACHER[1]

Tremendous effort is being exerted by teacher training institutions, teachers' organizations, and other allied agencies to increase the prestige of the teaching profession. In spite of the fact that the calling is one of the most if not *the* most important of all professional pursuits, judging by its objectives, it is not, as yet, accorded the dignified place which is its just due. One outstanding reason for this is that until recently no great stress had been placed upon professional training. This has resulted in the most natural assumption on the part of the general public that it was not a highly specialized type of professional activity. During the past decade, however, great strides have been made to right this wrong and during the course of the next decade we shall find an even greater movement in this direction.

The pressing need is for more highly trained, professionally minded young men and women who are inspired with the great opportunities the profession has to offer. Fortunately, the salaries have increased to the point where one can afford to look toward teaching as a life work without great financial sacrifice. This should aid to stimulate the attraction to the profession of an ever increasing number of desirable men and women, for any life work must, of necessity, furnish a respectable living.

The call is for professional teachers and to such are offered almost limitless opportunities for a career. No longer is there time or place for those who would make teaching a stepping-stone to other pursuits. The personnel of the teaching force is, because of necessity and for legitimate reasons, more or less transitory and it is thus inadvisable to add to this unprofitable shifting about by the employment of those who would use it as a makeshift.

[1] The material for this chapter is taken in part from a magazine article published by one of the authors. Permission to reprint it has been given by *Primary Education—Popular Educator.*

Of course when the time is reached that all teachers must have adequate professional training, the death knell will be sounded for a great bulk of this floating teaching population.

In many states the only requirement for certification on a limited basis is an A. B. degree. This degree is granted by an arts college which never has been and never will be organized to train teachers for classroom service. It has another and very important function to perform which in general it does well. The writer has known of cases where arts students have been certificated to teach subjects which they never studied in college.

Among others, New York State has taken a definite stand against such irregularities. The New York State Department of Education has ruled that after September 1, 1930, no limited certificates will be granted. This means that all who enter the teaching field after that date must have a certain minimum of technical preparation and that they will be permitted to teach only those subjects of their major or minor interest. This is a great step forward, which will tend to sift out undesirables.

It is to those men and women who look to teaching as a worthy vocation that this chapter is addressed. The material given here is neither that of classroom management nor the technique of teaching. It deals with a few suggestions on how one may better render professional teaching service. Perhaps a chapter of this sort should have no place in a book of this kind, but the writers have observed so many false starts made by teachers who did not seem to understand the significance of proper relationships that they concluded a word of advice on this score would be permissible.

I. THE TEACHER'S EQUIPMENT

1. **Character.**—First and foremost, and standing preeminently above all other types of equipment needed for teaching, is the possession of an unimpeachable character. No moral weakling can lead a child to strength of character, for character is forcefully taught through imitation. Every teacher has a potent influence over the students in his charge. The development of sterling character is too important an end to risk placing students under the pernicious influence of the morally weak. Life itself offers

sufficient pitfalls without subjecting immaturity to an unnecessary and tremendously puissant evil influence. A teacher cannot hope to develop high ideals in his students if he does not first possess them himself.

2. **Professional Attitude.**—The school expects the teacher to have a highly professional attitude toward his work. There is no room in the profession for the person who desires to teach until "something better turns up." The nature of teaching demands the flower of our manhood and womanhood to direct learning. The stakes are too great to venture placing any individual over a group of children who is not charged with the obligations and the opportunities offered by the profession. No person is too big to make teaching a life work and he who considers himself as such is indeed too stupid to be graced by the name "teacher."

But there are "teachers" in abundance who actually consider themselves "above" the work. The writer once heard a girl remark that she "was ashamed to admit she was a teacher." This misguided individual was not nearly so ashamed of the profession as was the profession of her. It is indeed unfortunate that a person of this stamp should be placed in a position of influence over helpless boys and girls who cannot control her presence. Such a teacher's influence must necessarily be unwholesome and her ability hopelessly poor. She has no interest in her work other than that of drawing her salary. Teaching (in her case) affords an easy way to earn a living. The profession has too long been the dumping ground for college and normal graduates who teach because there is "nothing better" in immediate sight.

If a teacher can answer the following questions in the affirmative he may be sure that his professional attitude stands as unassailable: (1) Do you consider that teaching offers boundless opportunities to better social conditions? (2) Do you consider that it is a privilege to better these social conditions through the education of youth? (3) Do you consider the teacher's task is so sacred a piece of work that it must not be desecrated by slipshod, haphazard, and half-hearted endeavor? (4) Do you consider the teaching profession big enough to offer a career to any individual? That person who can answer these questions with a

vigorous *yes* is the type which is a credit to the profession and an asset to mankind. Those who are in doubt should seek other fields for their endeavor, for they would be happier and the children better off as a result.

3. **Professional Equipment.**—The first element of professional equipment is a thorough mastery of the academic field in which the teacher is instructing. This consists of vastly more than the bare information given in the text in use. It must include a scholarly mastery carrying him far beyond the immediate classroom necessities. For how else can a teacher make the subject matter of a course function if he does not know its ramifications? How can he tie it up with life, if he is ignorant of all of its implications save those of its rudiments? It is to be hoped that the time is now short until the certificates of all high-school teachers will be limited to the teaching of those subjects only in which they have specialized.

A word of caution must here be inserted. A scholarly knowledge of subject matter may be dangerous if the teacher is, because of her advanced thinking in the field, unable to appreciate the immature students' difficulties in their efforts to attain its mastery. Further than this a scholarly mastery does not always include a control of rudimentary details. True, those details at one time became the foundation for the advance work, but in the consideration of the big issues during the scholarly pursuits these fade into the background. We must be ever mindful of the fact, however, that the elementary and secondary teachers' jobs deal with rudiments only and thus their equipment must necessarily include them. No teacher, regardless of scholarly attainment, can be free from a consideration of what to him may seem unessential details, but what to the students are fundamental and basic.

In addition to this control of subject matter, considering it both from an extensive and intensive point of view, the teacher must today have sufficient technical training for his work. The time when the best drill master made the best teacher has passed. So long as our conception of education was the cramming of

facts alone, the only requirements for teaching consisted of a knowledge of the facts along with the ability to *force* their mastery by one method or another. But today, with the development of our social objectives and our ever-increasing fund of objective data both in the field of method and educational psychology, no one can be equipped to teach without technical training. This professional education of teachers is just in its infancy and the tendency is in the direction of making it more and more intensive, a condition which is not unwholesome.

Just what are the minimum essentials for teaching? In the first place it is generally agreed that a broad cultural background is of fundamental importance. This broad training cannot be overemphasized for the more contacts a teacher has with life, its traditions, arts, and processes, the better is he able to interpret life to his students. One charge against teacher training institutions is that in the effort to emphasize the technical phases of the teacher's preparation the cultural background has been neglected. If this is true it is a just charge. The ideal method would be to have our teachers trained in the arts colleges first and then to follow this up with a year or two of intensive technical preparation. But this is, of course, at present an impossibility. However, the time will unquestionably come when, as in the professions of medicine, law and others, our training schools will be of a graduate type.

Probably the technical training of teachers should include first of all a survey of the history of education. This offers a necessary background upon which to build the other phases of the technical education. Unquestionably, each teacher should have a thoroughly worked out philosophy of education, for how else could he point his teaching? A knowledge of general and educational psychology is a necessity and the latter should especially emphasize the psychology of learning. A mastery of the best teaching techniques with their actual use in the classroom under carefully supervised practice conditions must be a part of the training. These constitute the minimum essentials only. Any other types of training in education should add their measure of increased equipment leading to more successful performance.

4. The Spirit of Professional Advancement.—A principal once asked one of his "seasoned" teachers to use a new device in the teaching of arithmetic. She at once informed him that she was not in favor of the introduction of "new fads" and that her methods (which she had been using for twenty-five years) were sufficient to get her pupils "through." This attitude is typical of too many of our teachers in service. Teaching method must, of course, change to keep pace with rapidly changing educational theory. Each year is marked by great advances and the teacher must constantly study to keep abreast of the times. We would not consider engaging the professional services of the old-fashioned, quack medical practitioner, neither should school authorities countenance the use of quack methods in their school systems of today.

The teacher is expected to keep in touch with the current educational developments. To do this he should be a regular subscriber to some authoritative professional periodicals. These appear in great numbers and indicate the trend of contemporary educational developments. He would do well to read each year a few of the latest education books of a general nature written by recognized authorities which give the latest accepted practice. One out of every third or fourth summer could, with profit, be spent in a summer school where information as well as inspiration may be secured. The summer school idea has grown to such proportions that every community is now in close proximity to some university or normal school where valuable professional and cultural courses are given for teachers. In reality the ease with which it is possible to keep up to date leaves no excuse for quack methods.

II. THE TEACHER'S RELATIONSHIP TO THE SCHOOL

1. Originality.—The classrooms are the great teaching laboratories of the world for it is here that many educational theories have had their inception. Teachers who have dared to step from the beaten path have led the way to the discovery of some of our greatest modern educational doctrines. The humble but courageous and conscientious teachers give the ideas which our research schools develop into standardized form for general use.

Schools of the right sort desire experimentation on the part of the teacher. They expect that he will develop ideas of his own and put them into use by applying them to his classroom procedure. It is true, of course, that such experimentation should not be done indiscriminately and never without careful controls to protect the children from any accruing harmful effects. A safeguard that must always be taken is to make sure that any experimentation involving a wide departure from the regular policy of the school is approved by the school administration. School officials, regardless of their interest in the development of new ideas, do not cherish being kept in ignorance of such new ventures. The school principal is responsible for all that takes place in his building and his approval and his cooperation should always be enlisted in all major pursuits.

There is no such thing as "the" method of doing a piece of work, but there is "a" method of doing it. The experimental method may not conform to those in common use, but that does not mean that it will not be as effective or even more so. The teacher's originality may lead to some new and more serviceable technique. One never knows how much good will be accomplished by a teacher who dares to blaze the trail with his originality.

2. **Student Activities.**—A junior high-school principal was asked what subject in his curriculum he considered to be of most importance. He replied, "Extra-curricular activities." He supported his contention by adding that such agencies came nearer furnishing real life situations than his curriculum which was held rigid by the local courses of study. His assertion may, or may not be true, but the fact remains that we are beginning to see with increasing clearness the limitless opportunities offered by our non-curricular school procedures. They are great socializing factors of the most potent sort and thus must become, if they are not already so, firmly rooted in our educational policy.

We no longer frown on athletics for we know that, if properly controlled, lessons of cooperation, ethics, fair play, honesty, and the other virtues can be taught in perhaps the most effective way. This is to say nothing of the physical advantages. The club in

almost any of its forms, which branch out into many fields of endeavor, can be made to develop the ability to follow as well as to lead, which is a big factor in citizenship. It is true that each individual, regardless of his position of leadership, must also be a good follower. In fact, practically all of those elements of character and worthy citizenship can be stimulated through the use of extra-curricular activities.

But to give the biggest returns such activities must be directed by those who understand not only their objectives but, also, the nature of boys and girls. Who is better fitted for such profitable leadership than the classroom teacher? It goes as part of the job and it is thus the moral requirement of each teacher to align himself in one way or another with one or more of these activities. It does not follow that each teacher can be a conspicuous leader, in fact it is desirable that he be the opposite. The really skillful director of student affairs operates quietly behind the scenes, guiding the activities of the student leaders. But it may be that because of already sufficient faculty guidance all that is left for a teacher is to offer moral support to those activities in which he is interested. This is an important contribution.

Besides the advantages to the students, mentioned above, there are among others two distinct advantages to the teacher who participates in student affairs. In the first place, it gives him a valuable contact with student life which will inevitably result in a clearer concept of the girl and boy. The only real way to learn children is to study them and this study is most efficiently done when they are free to express their tendencies. In the second place, such participation should tend to bring a teacher out of his classroom demeanor and establish contacts more human in their nature. This does not mean that a teacher should sacrifice self-respect, but it does mean that he should demonstrate his interest in things other than those academic. The teacher who can take an active interest in the affairs of students wins a place in their hearts.

3. **Professional Ethics.**—There is no well-established code of ethics for the teaching profession but it is definitely recognized as immutable that teachers should refrain from discussing their

colleagues or school affairs in general. That some teachers talk too much about school matters outside the confines of the school is a fact. Much mischief is done by such excessive talking. It is true that all talking of this nature is not malicious in its intent but in spite of this it is always dangerous to indulge in such discussions. One never knows when he will be misinterpreted and even misquoted. Many an innocent and unwitting remark has fanned the spark of jealousy into furious flame.

Unfortunately, the school and its teachers furnish a choice field for community gossip. Nothing seems more pleasurable to some people than the knowledge that irregularities exist in the school, for its dissemination furnishes for them a great source of satisfaction. Such individuals "pump" teachers with the hope of locating some vulnerable spot in the school system. Anything that they may find having the slightest semblance of existing difficulty is easily twisted and exaggerated to suit the whims of the talebearer. Thus, it is best for the teacher to be ignorant of everything of a professional nature which the "pumper" is seeking to find out. It must be remembered that the teacher's job is to teach and not to act as a "reporter" covering school affairs for the information of the general public.

This is not to be construed as meaning that a knowledge of the school and its various activities should be withheld from the public. Indeed the patrons *should* know vastly more than they ordinarily do. But before a teacher sets out on a pilgrimage to inform the populace, he should be sure that he is the best agency through which the information is to be conveyed. There are legitimate means by which the outside world can get its information, and these methods are usually carefully worked out by the principal or superintendent and the information is released by him. There is no danger in letting the public know *all* about the school, but it is best done in an official way. Indiscreet medical men and lawyers may gossip about their professional matters, but they are always held in disrepute. In like manner, gossiping teachers are looked upon askance.

Thus, a principal may be making many mistakes but teachers should be loyal to him outside of school. Certain teachers may be demonstrating various degrees of inefficiency but professional

ethics forbids the airing of these difficulties even among the rest of the teaching body. The policy of the school may not be effective but these inadequacies will not be righted by broadcasting them. On the other hand, they may with much dispatch be corrected by working from within, meanwhile demonstrating absolute loyalty. Loose talk concerning cases of discipline is easily interpreted as inefficient control on the part of the teacher involved. A real professional teacher will not "tell tales outside of school."

III. THE TEACHER'S RELATIONSHIP TO THE COMMUNITY

Many teachers who would otherwise be very successful have failed because of a lack of proper community adjustments. Communities, and particularly those of small cities and villages, expect many kinds of social responses from teachers, some reasonable and perhaps more often unreasonable. In some places a teacher would be severely censored for dancing or card playing, while in other locations the inability to do these things would be interpreted as a lack of social qualities. Communities have traditional ways of viewing the appropriateness of social relationships, which may be used as the weather vane by the teacher, indicating the type of contacts to make.

It must not be assumed that the teacher should submerge his personality or ideals in the effort to be a "conformer." This is not only unwise from the standpoint of democracy but it places an element of unnatural restraint on those in the profession. Teaching, to be attractive, should offer the same opportunities for free, happy, and independent living as does any other of the professions. But it is not only wise but fair and just that the teacher's activities and contacts be so controlled as to be inoffensive. Nothing that the teacher does outside should hinder the work inside the school.

Despite the fact that it is only proper not to air one's views publicly, if such are offensive, some teachers persist in doing it and to their detriment. The writer has known of cases where young teachers have entered a new and somewhat staid community with the idea of "awakening the old burg." They, in terms of

the community, "cut fast and loose" and set a pace which was classed as improper. The fact of the matter may be that the "burg" needed awakening but it is usually disastrous to give it that impression. A teacher need not modify his ideals one whit or make any effort to line them up with those of the community he serves. What is needed is tact and wisdom in the control of his activities with no parade of his divergent views of social responses where such display is likely to militate against the best interests of the school.

1. **The Commuting Teacher.**—The teacher's job has more of a community aspect than those of most of the other professions. He is engaged by community officials, paid by taxpayers, and his work is with the most precious of community possessions, childhood. The teacher must thus be identified as an integral part of the community which offers him the field for the practice of his art. He must be associated with community affairs; it is rightfully expected of him. He, therefore, cannot with effectiveness, other things being equal, be a "commuting" teacher, nor can he be a "five-day-a-week teacher;" that is, one who leaves town immediately after the close of school on Friday afternoon.

The great objective of the teaching program is the training of citizens. One of the most fundamental elements of good citizenship is an active interest in community affairs. Obviously, it is difficult to train boys and girls to take this active interest if the teacher himself is in no way exemplifying those attributes he is attempting to establish. Every walk of life furnishes its leaders of local affairs. There is no real reason why such leadership should not be drawn from the teaching profession. It does not take long for students to detect aloofness and when they do, the teacher's influence in training for citizenship is materially diluted.

It is not necessary that each teacher plan a campaign to assume an aggressive leadership in local affairs. Further, it is not to be interpreted that he must become a victim of community exploit, giving to it such an abundance of time and energy that he has little life left for the practice of his major purposes. But it does mean that one should align himself with some of the local activities. Clubs, societies, lodges, business men's associations,

churches, and the like furnish excellent opportunities for the expression of varying degrees of social activities. Such contacts are very desirable as well as necessary, for through them the teacher can build up an understanding of existing conditions helpful in the interpretation of school and local situations. Valuable and lasting friendships evolve from such associations, which add to the richness of life. And they further furnish a means of shaking off the schoolroom atmosphere which if not done periodically leads to the dangerous malady of a "school-teaching complex." The commuting or five-day-a-week teacher cannot easily make such desirable contacts.

Extra school activities such as parties, athletic contests, debates, plays, and the like are usually given on Friday or Saturday evenings to avoid a conflict with regular school pursuits. The value of demonstrating an active interest in these events has been discussed. But it is indeed difficult to manifest this interest if one commutes or is not in town over the week ends.

It is clear that much argument can be advanced in favor of the teacher identifying himself with the community. At least he should maintain his home there and spend some of his week ends there, even though it may be boresome to do so. And, above all, he should be a community "booster" for to be otherwise is dangerous. Community pride may be built up on a most trivial and unworthy basis from your point of view, but it is a force that must be recognized.

2. **The Development of Friendships.**—In many localities there are those who "rush" new teachers. But teachers should be slow in making intimate friends, for it is easy to make the mistake of forming undesirable associations. Also, quickly made friendships often prove to be temporary and the necessary breaking of them constitutes a problem which many times leads to serious difficulties. Again, too intimate contacts tend to shut out the companionship with others which may be just as satisfactory and many times more desirable. But this is a personal matter which must be worked out by the individual teacher. The only excuse for suggesting it here is that the writer has noted many cases where great difficulties, much embarrassment, and needless

gossip could have been prevented by a more judicious choice of associates.

Problems and Exercises

1. A young teacher who signed a contract in May to teach in a certain school system wrote to the principal for a list of rooming places. After correspondence with each of those suggested she selected the place that seemed most attractive. Late in the fall she found conditions very unsatisfactory. She was supervised too closely, her room was cold, and the landlady tampered with letters and other personal effects. How should this teacher meet this problem and how could she avoid the repetition of a similar poor choice?

2. Miss B., a high-school teacher who was teaching for her first year in a certain community, soon found that there existed a sharp line of cleavage between the grade and the high-school teachers. The grade teachers thought the high-school teachers "snobby" while the latter thought the grade teachers "clannish." This condition irked Miss B. as little personal interest existed between the two groups. What could she do to alleviate the unwholesome situation?

3. What should be the relationship between educational development and state certification requirements?

4. From the current professional periodicals for this year work out a bibliography of the articles dealing with the teaching of your major subjects.

5. Analyze the personality traits of several successful teachers. List in order of importance the elements you think to be of greatest value in determining the success of these teachers. Suggest ways in which these traits may be developed.

6. Miss J., an inexperienced teacher, accepted the position to teach English and history in a small rural high school. She is a vigorous young woman with a fascinating personality and manner. The boys and girls liked her from the start and she identified herself almost immediately with student activities. In her desire to get their cooperation she placed herself on their level while outside of school. It soon developed that some of the girls with whom she was most closely associated, called her "Betty" and took other unwarranted privileges. Soon this seemed to lead to disrespect. How would you meet this situation?

7. Miss T. lived in a village near the place in which she was teaching and thus went home every week end. Miss W. lived far away and could not leave except at vacation times. Miss T. missed all of the athletic and social events of the school while Miss W. seldom missed any. Miss T. noticed that the students made a confidant of Miss W. while she herself was completely ignored. Interpret this.

8. In a certain community a "teacherage" is furnished for the use of those women teachers who may desire to live there. Each year some ten or twelve teachers of the high school and grades make their home here. Discuss the advantages and disadvantages of such a plan.

9. Suggest a list of topics suitable for use in teacher study groups in a school system. What suggestions would you give for the organization and administration of such groups?

10. What are some of the elements which tend to undermine teaching as a profession?

References for Further Study

BAGLEY, WILLIAM C., and JOHN A. H. KEITH, "An Introduction to Teaching," Chap. XI, The Macmillan Company, 1924.

BAGLEY, WILLIAM C., "Classroom Management," Chaps. XVI, XVII, XVIII, The Macmillan Company, 1907.

CUBBERLEY, ELWOOD P., "An Introduction to the Study of Education and Teaching," Chap. VIII, Houghton Mifflin Company, 1925.

DAVIS, SHELDON E., "The Work of the Teacher, Chaps. III, IV, The Macmillan Company, 1918.

DAVIS, SHELDON E., "Self Improvement, a Study of Criticism for Teachers," Chaps. II, IV, The Macmillan Company, 1927.

FRASIER, GEORGE W., and WINFIELD D. ARMENTROUT, "An Introduction to Education," Rev. Ed., Chap. III, Scott, Foresman and Company, 1924–1927.

HINES, HARLAN C., "Finding the Right Teaching Position," Chap. II, Charles Scribner's Sons, 1926.

MOORE, M. E., "Parent, Teacher, and School," Part III, The Macmillan Company, 1923.

SEARS, J. B., "Classroom Organization and Control," Part V; Houghton, Mifflin Company, 1918.

STARK, WILLIAM E., "Every Teacher's Problems," Chaps. X, XI, XII, XIV, XV, American Book Company, 1922.

STRAYER, GEORGE D. and N. L. ENGLEHARDT, "The Classroom Teacher," Chap. XV, American Book Company, 1920.

THOMAS, FRANK W., "Principles and Technique of Teaching," Chap. XIX, Houghton Mifflin Company, 1927.

WALSH, M. J., "Teaching as a Profession," Part II, Henry Holt & Company, 1926.

WHITNEY, FREDERICK L., "The Growth of Teachers in Service," The Century Company, 1927.

WRIGHT, EDITH, " A List of Books for a Teacher's Professional Library," U. S. Bureau of Education, *Teacher's Leaflet*, No. 17, p. 15, 1924.

"Nominations for Our Teacher's Bookshelf," *The Journal of the New York State Teacher's Association*, Vol. XI, pp. 78–85, March, 1924.

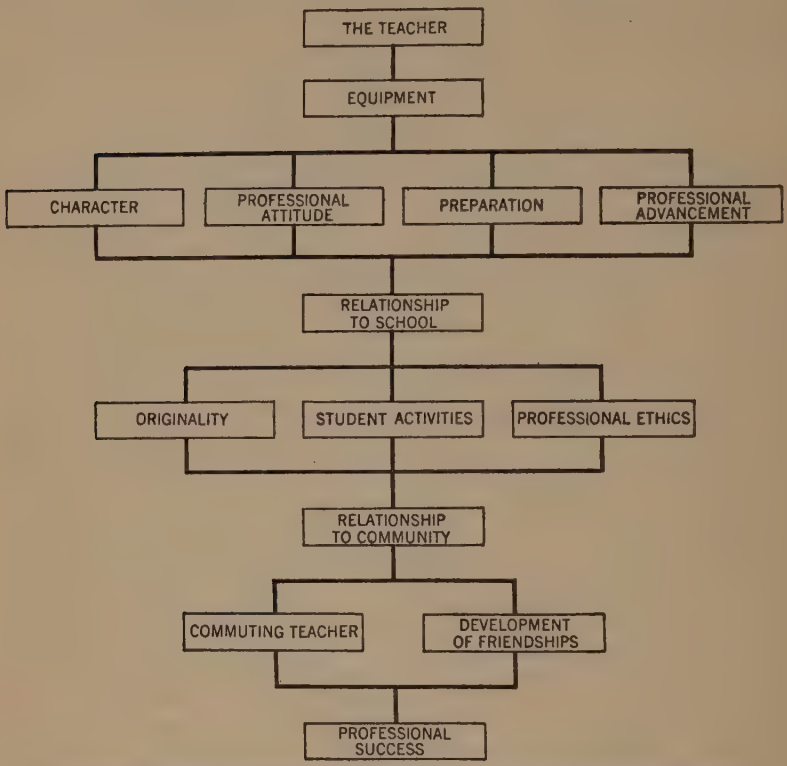

Fig. 20.—Graphical representation of the content of the chapter, The Teacher.

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